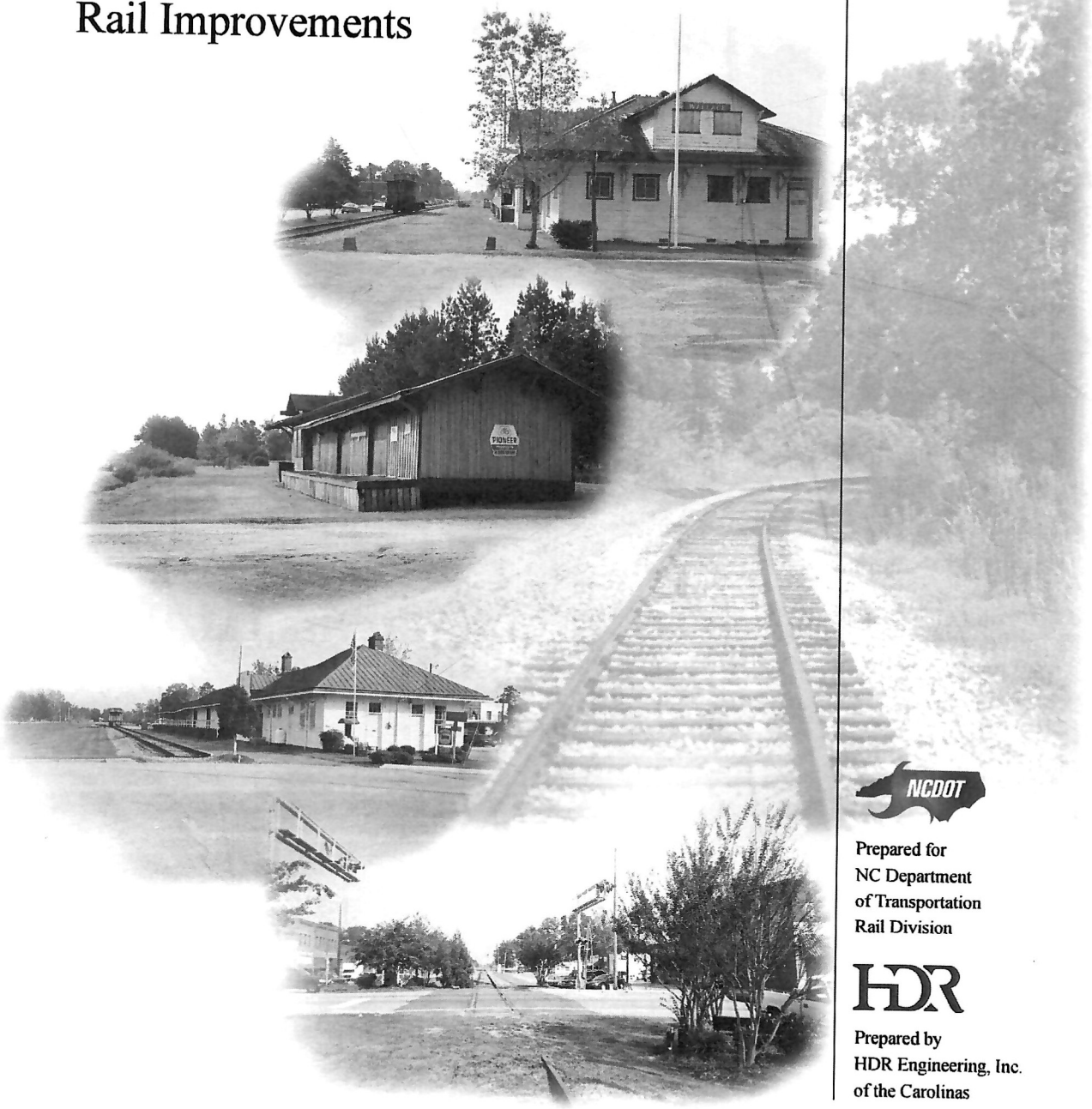
Economic Feasibility Study for the

February 2004

Restoration of the Wallace to Castle Hayne Rail Corridor and Associated Port/ Rail Improvements



NCDOT

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1. Introduction and Purpose of the Study

A continuing goal for the use of the North Carolina Department of Transportation's State-owned rail infrastructure is to enhance the economy of North Carolina by directly providing or facilitating the provision of competitive rail service for use by North Carolina business and industry. Cost-effective and efficient transportation of freight, both international and domestic, has been recognized by the NCDOT, the NC State Ports Authority (NCSPA), the NC Department of Commerce (NCDOC), and other state agencies as critical to the success of the State's economy. This economy is highly dependent upon the ability to move goods and passengers throughout the state, as well as to and from other domestic and foreign markets. Remaining competitive with business and industry located in adjacent states is a vital component of sustaining the State economy. These competing businesses can utilize major seaports such as Norfolk, Charleston and Savannah, which have excellent rail connections to primary mainline routes, to attract large volumes of freight and provide business incentives.

Freight to and from the Port of Wilmington and the business and industry located within southeastern North Carolina's coastal counties relies exclusively upon rail service provided by CSX Transportation (CSXT). CSXT gains access to Wilmington from the west via their Wilmington Subdivision, a former Seaboard Air Line (SAL) route, which is the only current rail route into the Wilmington area. The majority of rail traffic to and from Wilmington passes through CSXT's congested rail center and hump yard at Hamlet before accessing the primary CSXT north-south and east-west mainlines. Hence, rail access from Wilmington to a major portion of the state's population and business centers, Raleigh-Durham, and the I-95 corridor is circuitous and indirect. Agricultural commodities used and produced within southeastern North Carolina, business and industry products of greater-Wilmington, and a large volume and variety of international imports and exports flowing through the Port continue to be hampered by this indirect rail routing. Development of high-capacity, high service-level, competitive rail-service has not proven to be a strong interest of CSXT over this line. Norfolk Southern Corporation (NS) currently does not have access to the Port of Wilmington, thus limiting competition for rail services.

State of North Carolina officials showed their visionary thinking in 1994 when the State acquired and preserved about 27 miles of the former CSXT W&W Subdivision. CSXT abandoned a portion of this former Atlantic Coast Line (ACL) route between Wallace and Castle Hayne in the mid-1980s. CSXT removed the track and most of the bridge structures at that time, and the corridor has been dormant since then. This Study will examine the feasibility of restoring this abandoned right-of-way to an active freight railroad as an alternative and more direct freight routing for southeastern North Carolina. This rail corridor, which the State purchased in 1994, would connect the CSXT lines serving the Port at Wilmington to Wilson (via Contentnea) and points north on the CSXT system. This would form a more direct and less-congested rail route that would use the primary CSXT north-south main line along the I-95 Corridor. Figure 1 shows the NC state railroad system map to illustrate the location of Wilmington and the Wallace to Castle Hayne segment relative to business centers in NC and adjacent states.

This Study is jointly sponsored by the NCDOT Rail Division and the NCSPA. Improved rail system advantages would be created by avoiding the current circuitous rail routing by reopening the Wallace to Castle Hayne segment. The reopening would increase the potential to attract new business for the Port of Wilmington. A newly reopened rail segment would provide new opportunity for deep inland rail service and direct rail service to and from the Port to inland industrial sites. A recently completed grain facility at the Port consists of a ship-shore grain handling conveyor system and shore storage bins (Circ-A-Bins®). This joint venture of the NCSPA and the primary hog-production cooperative within North Carolina was placed into service in early 2003. Currently, import grain arrives at the Port by ship, and then is moved by truck to several feed-mixing sites in the vicinity of Wallace and Warsaw, both north of the severed Wallace to Castle Hayne rail segment. The NCSPA has identified the potential of using a grain shuttle train from the Port to the Wallace/Warsaw area using the restored line segment as an alternative to trucking. Additionally, a restored line segment could also provide a more efficient routing for export grain to be shipped in unit trains to the Port.

CSXT, although a potential major stakeholder, has not provided input for this Study. At the initiation of this project, the NCDOT Rail Division and CSXT had several conversations regarding the proposed level of participation by CSXT. NCDOT and CSXT were not able to come to an agreement to identify CSXT's participation at any level. Therefore, the NCDOT Rail Division subsequently determined that this Study would proceed without direct CSXT input, using information regarding CSXT routes and knowledge of CSXT operations to which NCDOT already had access. HDR's effort for this Study has used only information provided by NCDOT. NCDOT furnished a draft Project Report for CSXT for their review in November 2003. CSXT's response is included as Appendix P.

This Study does not address any environmental issues. A separate environmental screening review of the potential reopening was completed in late 2002 by another consultant to the NCDOT Rail Division. After this Report has been circulated among the key stakeholders, future planning will include identifying the requisite steps in the environmental process. Public involvement has not been touched upon for this Study and will also be considered independently as the planning process proceeds.

The NCDOT Rail Division anticipates that the key stakeholders will review the contents of this Report and provide comments toward reaching a consensus on the potential of the restoration of the Wallace to Castle Hayne rail segment. Then, issues of funding, phasing and stakeholder responsibilities must be defined in order to determine what appropriate next steps will be required to move the project from concept through advanced planning and design to implementation.

Methodology

The overall objective of this Study is to provide and test a "Proof of Concept" that will examine both the technical and economic feasibility of reopening the Wallace to Castle Hayne rail segment. The results of this Study are given in this Report that will:

- Determine infrastructure improvements and capital costs required to reopen the Wallace to Castle Hayne segment for 40 mph freight operation.
- Recommend improvements and determine capital costs for existing CSXT connecting line segments to support the reopening.
- Evaluate the existing and reopened rail operations to determine potential cost savings and benefits to rail users.
- Determine the overall economic value to private business and to the public derived from reopening the railroad segment.
- Determine the financial feasibility and provide justification for completing the reopening project to support freight rail operations.

In conducting this Study, HDR has reviewed information provided by NCDOT for the abandoned Wallace to Castle Hayne corridor and for existing active CSXT corridors. HDR and NCDOT staff jointly performed a field review to assess the features and general condition of the abandoned corridor. Since CSXT was not an active participant in this Study, HDR staff was limited to only cursory observations of CSXT train operations and CSXT-owned infrastructure at points of public access, i.e. highway-railroad grade crossings, adjacent highways, and overpasses. Interviews with staff from local shippers and connecting short-line railroads also provided insight into CSXT operations in the area.

HDR conducted a number of stakeholder interviews, which are documented in this Report. In July 2003, HDR staff conducted a project workshop in Raleigh to brief key stakeholders of the progress of the Study. Representatives of the NCDOT Rail Division, NCSPA, NCDOC, and CSXT attended this workshop.

The remainder of this Report is organized as follows:

- Chapter 2 includes an overview of the existing CSXT rail operations and routes in southeastern North Carolina. This chapter also identifies potential rail operating scenarios for the reopened segment.
- Chapter 3 identifies the rail infrastructure needs that would be required to restore 27.1 miles of former railroad track between Wallace and Castle Hayne to again allow freight rail operations.
- Chapter 4 considers rail infrastructure upgrades on the existing connecting CSXT-owned trackage. These upgrades are recommended to permit higher speeds for increased freight train service with greater flexibility and reliability.
- Chapter 5 contains an economic analysis that evaluates the costs/benefits and regional economic development impacts that may accrue to the various project stakeholders. These parties include the State of North Carolina; the NCSPA; CSX Transportation; private businesses and industry; local governments; and other economic units along the reopened rail corridor, as well as other regions of the State.

The Appendices contain relevant information that is referenced in the Report including order-of-magnitude cost estimates for rail infrastructure needs.

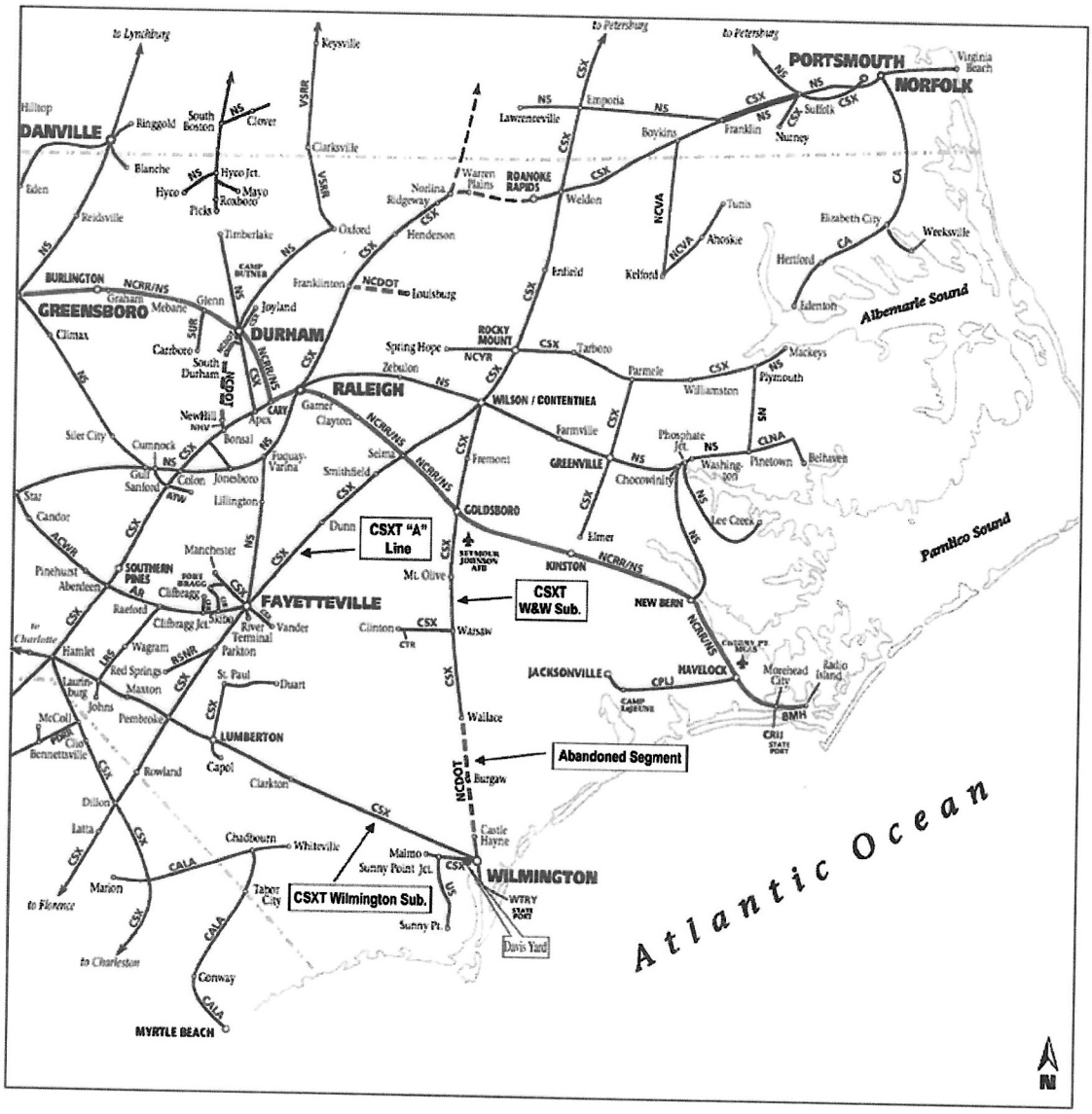
Insert Figure 1

2. Existing and Proposed Rail Operations

2.1 Overview and History

The implications of restoring the abandoned Wallace to Castle Hayne corridor can be better appreciated by understanding the existing rail network in the region, both historically and as currently operated. Figure 2.1 shows the existing rail network for the eastern portion of North Carolina. Railroading has been most influential to the development of the cities and ports in this portion of the State.

Figure 2.1
Eastern North Carolina Rail Lines



From the early 1800s through 1986 various rail companies and systems were developed for serving the Wilmington area and inland locations, to include many years where major north-south domestic freight rail traffic passed through Wilmington. A principal railroad company accounting for the history of early rail service for Wilmington was the Wilmington and Weldon Railroad (W&W), which later became a part of the Atlantic Coast Line (ACL) system which was headquartered in Wilmington. The growth and development of the City and the Port are intertwined with that of the ACL and its' major competitor, the Seaboard Air Line Railroad (SAL). During the years of evolution and rail company consolidations, optimization of other major north-south railroad routes to the current I-95 corridor left Wilmington with little or no through traffic. Wilmington decreased in importance as a major rail center, and in 1960, the ACL moved its' corporate headquarters from Wilmington to Jacksonville, FL. Ultimately through subsequent mergers, the ACL joined with the SAL and several other lines to form the Seaboard Coast Line Railroad (SCL), the Seaboard System Railroad (SBD) and ultimately CSX Transportation (CSXT) in 1986. CSXT's extensive system throughout the eastern half of the United States today provides the only rail service to the greater Wilmington area.

Over the years, the majority of through north-south freight traffic operations on the ACL system were shifted to the "A" Line (the current primary north-south CSXT mainline between Wilson and Pembroke), which offered a shorter through-route to points south than the route through Wilmington. Following the ACL-SAL merger to form the SCL in the late 1960's, the former SAL hump yard at Hamlet increased in importance as a major regional classification yard. Through traffic and traffic for the Wilmington area and the Port were eventually rerouted off the former W&W (by then known as the W&W Subdivision south of Contentnea). As through traffic decreased, the former W&W Subdivision between Contentnea and Wilmington became a secondary line with the majority of traffic consisting of grain shipments to the numerous feed mills in the Warsaw area. In the mid 1980's, CSXT made a business decision to abandon a portion of the W&W Subdivision between Wallace and Castle Hayne. At one time, five major rail corridors radiated from Wilmington; today, only the former SAL route west to Pembroke and Hamlet remains.

2.2 Existing Rail Service to the Wilmington Area

Since CSXT was not an active participant for this Study, HDR's understanding of CSXT operations in eastern North Carolina is based on information provided by the NCDOT Rail Division. HDR staff was limited to only cursory observation of CSXT train operations and infrastructure at points of public access, i.e. highway-railroad grade crossings, adjacent highways, and overpasses. It is anticipated that CSXT participation in future stages of the Study process will result in more accurate information being made available.

Currently, Wilmington receives all of its mainline rail services from CSXT's Florence Division. CSXT's operations in the Wilmington area are based at Davis Yard, which is located near Navassa to the west of the Cape Fear River. Davis Yard lies at the easternmost end of CSXT's Wilmington Subdivision, whose western terminus is CSXT's hump yard at Hamlet. Maximum

authorized speed on this route is 49 mph between Hamlet and Pembroke and 40 mph between Pembroke and Davis Yard. Direct Traffic Control (DTC) blocks are used to govern train movements. Under this method, the line is divided into a number of finite segments called blocks. The trains receive verbal authority to occupy the blocks from the CSXT train dispatcher in Jacksonville, FL. Signaled track with either Centralized Traffic Control (CTC) or automatic block signals is not used on the Wilmington Subdivision.

At Pembroke, the CSXT Wilmington Subdivision crosses CSXT's South End Subdivision which is a key portion of the "A" Line. This former ACL trunk line links Richmond, VA to Jacksonville and ultimately Tampa, FL. From this critical north-south main, the W&W Subdivision diverges at Contentnea (near Wilson), with a southern terminus at Wallace. As described previously, the W&W Subdivision once continued to Wilmington, but the 27.1-mile segment between Wallace and Castle Hayne was abandoned in the mid 1980's. Thus, the CSXT lines in the area of interest form a triangle, with the northern point being Rocky Mount, the southwestern point being Pembroke and the southeastern point being Wilmington.

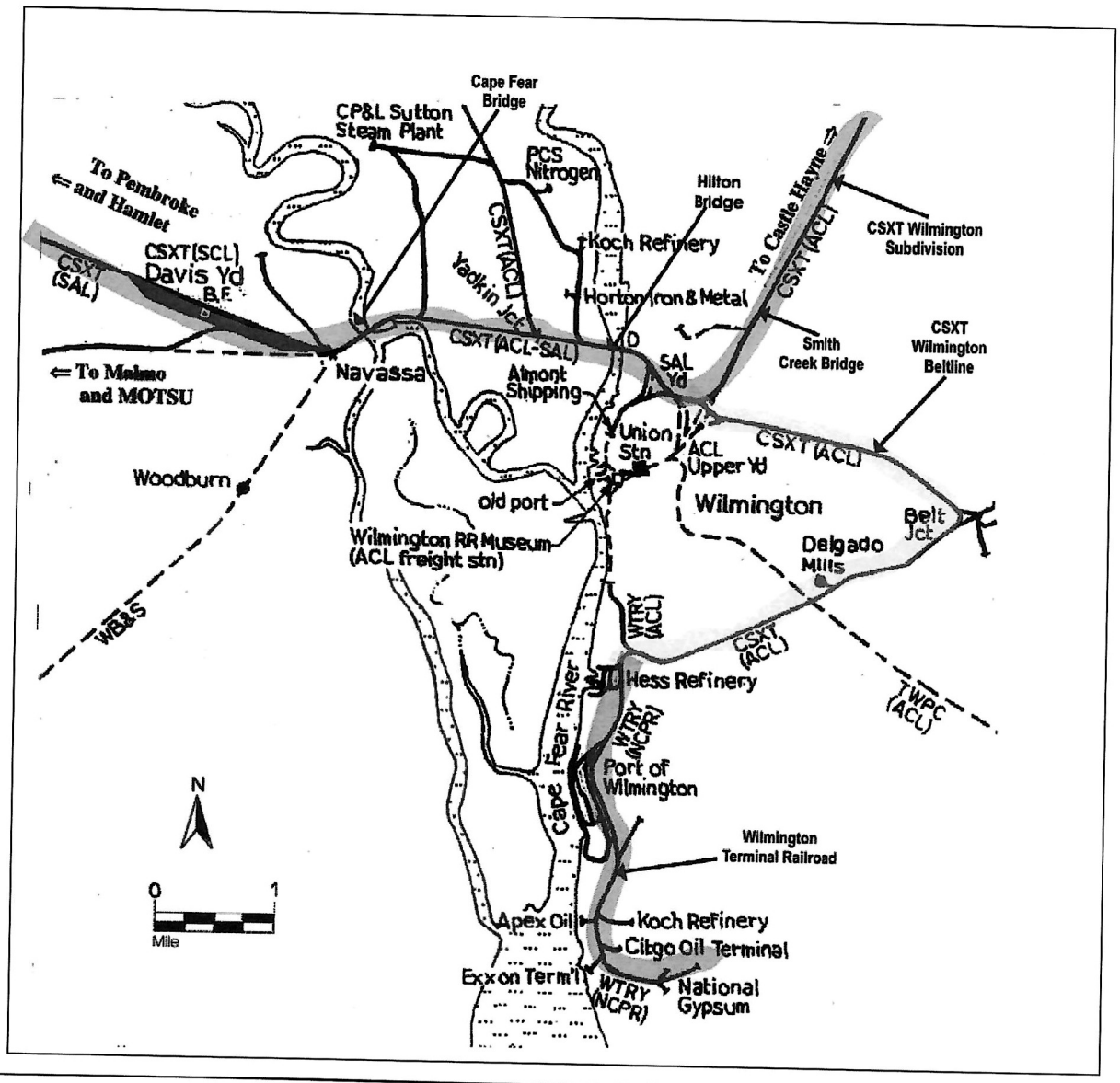
With Davis Yard as a base, CSXT operates several industrial switching and transfer jobs serving local industries on a number of branches. Figure 2.2 shows the trackage in the Wilmington area. CSXT trackage from Davis Yard includes:

- Former Wilmington, Columbia, and Augusta Railroad/ACL trackage west to Malmo. This line is known as the Malmo Spur and includes the interchange with the U.S. Army (USA) Railroad at Leland. The USA forwards cars to the Military Ocean Terminal at Sunny Point (MOTSU) and other on-line industries.
- Former ACL and SAL trackage east to Wilmington and then north to Castle Hayne. This line is an extension of the Wilmington Subdivision and will be referred to in this Report as the main line terminal track. A large quarry is located at Castle Hayne. CSXT also serves a number of local industries in the Wilmington area. A spur to Progress Energy's CP&L Sutton Plant breaks off this line just east of Davis Yard. All rail traffic operating east to Wilmington must use two movable bridges with restrictive clearances, the Navassa Bridge and the Hilton Bridge.
- At a point north of downtown Wilmington east of McRae St. near the former site of the ACL Upper Yard, the Wilmington Belt Line breaks off the main line terminal track. This combination of former ACL lines proceeds east then southwest through a number of neighborhoods to an interchange with the Wilmington Terminal Railroad (WTRR). CSXT trackage extends to a point between Third Street and Second Street. NCSPA/WTRR trackage picks up at this point which is not on Port property. The NCSPA contracts with the WTRR to operate trackage that serves the Port as well as a number of local industries both north and south of the Port property.

With the W&W Subdivision north of Wilmington having been severed, all Wilmington traffic, regardless of its origin or destination, must move on the Wilmington Subdivision via Hamlet and/or Pembroke. For the most part, traffic is handled on road trains to or from Hamlet Yard, where cars are sorted for continued movement. Large multi-car shipments of grain and coal run

past the yard, moving directly to the railroad's customers in the Wilmington area. Most current Wilmington rail traffic moves to or from points to the west or south, so operation via Hamlet is the most direct for these movements. However, some traffic moves to or from points to the north. For such traffic, cars must take a more circuitous route and consume more time in transit than would be possible if a continuous rail line between Contentnea and Wilmington were restored. Most traffic destined for the Wilmington area from the north moves south past Rocky Mount yard, runs to Pembroke and turns westward to Hamlet Yard, where it is switched and moved on road trains back through Pembroke to Wilmington. This route is reversed for movements from Wilmington to the north.

Figure 2.2
Wilmington Area Rail Lines



Routing is different for large multi-car shipments to the Wilmington area from the north. Unit coal trains for the CP&L Sutton Plant travel south past Rocky Mount yard, run to Pembroke, and then use an existing rail connection to turn westward onto the Wilmington Subdivision. The unit trains then travel west for about 5.5 miles to Wilkes Siding, where they reverse direction (i.e., engines run around the train). The coal trains then again pass through Pembroke going east and terminate at Davis Yard. These trains take twelve hours or more enroute due to congestion on the Rocky Mount – Pembroke single-track portion of the "A" Line and the circuity of the route. An industry crew based at Davis Yard transfers the loaded cars to the power plant and returns the empty cars to Davis Yard for continued movement by the reverse route to be reloaded.

CSXT delivers and picks up dedicated blocks of cars for the WTRR at the Port of Wilmington five or six times a week. This train leaves Davis Yard and proceeds over the trackage previously described to the Port. This train generally does no other work in the area. Cars are set off on the Port property for further switching by the WTRR. The CSXT locomotives then pick up a block of cars that has been assembled by the WTRR and returns to Davis Yard. The cars then are sent on to Hamlet for further routing.

2.3 Existing Rail Service to Warsaw and Wallace

The CSXT W&W Subdivision begins at about MP AC-139.0 in Contentnea and ends at the end of track in Wallace at about MP AC-208.1. At Contentnea, the W&W Subdivision connects with CSXT's South End Subdivision, a double-track portion of the "A" Line. A power-operated turnout in the No. 2 main track directs trains to and from the single-track W&W Subdivision. Train operations on the W&W Subdivision are governed by Direct Traffic Control (DTC). The North Carolina Railroad (NCRR)/NS line between Raleigh and Morehead City crosses the CSXT line at-grade in Goldsboro at about MP AC-160.0.

By far, the predominate traffic on the Contentnea to Wallace line is food stocks for poultry and hog feed, with much of it moving in unit trains to Warsaw. On the average, 50 loaded unit trains of feed per month from the Midwest are destined for the Warsaw area. The Pigford Yard agency in Warsaw handles local train movements. From Warsaw, unit trains are shuttled to two feed lots south of Warsaw at Rose Hill on the W&W Subdivision and two feed lots west of Warsaw at Moultonville and Turkey on the Clinton Spur (MP AC-191.6 to AC-199.0).

There are a number of non-feedstock industries around Warsaw and Goldsboro, so local switchers work out of each location. The Goldsboro local works businesses at Mount Olive and Dudley as well as Goldsboro industries and the small NS interchange. The Warsaw local makes a 12-hour turn to Rocky Mount, picking up and setting out cars enroute as required. At Clinton, CSXT interchanges traffic, primarily coiled steel, with the Clinton Terminal Railroad at MP AC-199.0.

2.4 Operations for a Restored Wallace to Castle Hayne Segment

A number of rail operating changes could result from a reopened line segment. This section examines different scenarios for operation of the restored segment. Chapter 5 contains a detailed discussion of potential changes to the types of rail traffic that could result from the reopening of the Wallace to Castle Hayne segment. Chapter 5 also describes in detail a potential unit shuttle train for grain that could operate between the Port and the Wallace/Warsaw area using the restored segment.

2.4.1 General Operating Schemes Using a Reopened Segment

The previous description of current operations clearly defines that freight with origins and destinations directly west (to the southern Appalachians) and the southeast would not change with a reopening. Geography is such that the current routings into Wilmington from those areas will remain the same with the possible exception of an isolated special operational niche shipment that could use the reopened segment as outlined in Chapter 5.

The description of current operations also very clearly points up the key reopening advantage as being for routing of cars to/from north and northwest destinations/origins. With a reopening, use of the renewed Contentnea-Wilmington direct line would eliminate numerous constraints and provide reduced running distances and crew changes. As well, it would bypass the congested Hamlet Yard and possibly Davis Yard for direct deliveries of port traffic and unit trains of coal. It would eliminate other disadvantages of the current routing of freight to/from the north e.g., delays due to heavy use of the "A" line between Contentnea & Pembroke, routing of trains through Hamlet (west of Pembroke) for switching and classification, reversing of direction at Hamlet for unit-trains, very few bypasses of Davis Yard, terminal delays at Davis Yard, train reversals at Davis Yard, and required use of the two movable bridges for Wilmington destinations. It would appear that virtually all current and forecasted CSXT traffic to/from the north and northwest of southeastern North Carolina would make use of this "closure of the triangle."

In addition to general use of the reopened line for efficient access from the north and northwest, primarily from reduced distances and travel times, additional schemes of operation for specific freight business could include:

- Through-passage of cars to gain efficiencies (Example: through movement of grain trains to the Port for export that dead-end at Wallace)
- Use of new "back-haul" opportunities to reduce empty car moves
- Direct-access to destinations without the use of Davis Yard (Examples: direct coal unit train movement to the Sutton Plant and direct access to the Port of Wilmington)
- Avoidances of high/wide limitations on either leg of the triangle
- Routing changes to relieve congestion on the "A" line
- Use of new rail access to sites within the 27 miles of reopened railroad

- Use of new port-rail access to sites north of Castle Hayne (example: use of rail instead of trucking from/to the Port)
- Use of alternative access of either leg of the triangle during weather and/or operational emergencies
- Use of an alternative route to reduce hazardous materials public exposure

However, CSXT lines connect on either side of the restored Corridor.

With a reopening, the above operational improvements and potential new operational uses and efficiencies will almost certainly be instituted by the operating entity of the improved rail system for this region. However, new operational use schemes of a reopened line will ultimately be dependent upon business decisions of the operator and demands of the market place.

Chapter 5 also addresses the specific potentials for creating economic benefit from these operational improvements caused by a reopening. Those potentials include reduced costs of shipping current and forecasted volumes of freight, increased use of rail, induced volume increases and creation of new businesses.

2.4.2 Potential Rail Operating Scenarios for a Reopened Segment

Since CSXT operates the lines that connect to Wallace and Castle Hayne, CSXT would be the most logical operator of the restored line segment. Since NCDOT now controls the corridor, an operating agreement would need to be negotiated between the State and any potential rail operator before rail service could resume. Since CSXT has not retained operating rights over any re-constructed tracks on this segment of right-of-way, any alternative operating arrangement by another entity would not necessarily require a new operating agreement between the State and CSXT. A decision to reconstruct must address recovery of capital costs that may or may not include cost implications for CSXT. Simply stated, this Study cannot assume that if reconstruction takes place, CSXT will merely start using the improved line without need for a business decision on their part. That business decision will not only include any capital or capital recovery implications for the railroad but new operating costs as well as new operating income potentials. These factors, that are bound to be part of later phases of this project effort, could cause CSXT to be amenable to allowing another operator who could be more cost-effective. This presents a good opportunity to allow another operator to meet special needs between Wallace and Wilmington. It is possible that CSXT might be amenable to allow some amount of Wilmington area business to be handled by a short line operator with a new interchange in the Wallace area or further north. Chapter 5 addresses various new business opportunities presented by a reopening including a few that present options for using an alternative operator. Using some of those potential opportunities as examples, the operating scenarios and options for potential operators of the segment are addressed in the following sections.

Operation by CSX Transportation

All potential rail traffic from the Wilmington area and Port that are bound for points north and

northwest on the CSXT system would be handled across the reopened line by CSXT to Rocky Mount, Richmond, and further. This represents a basic extension of CSXT operations utilizing the reopened segment to enhance all types of rail operations including special new businesses such as the potential for import and export grain through the Port of Wilmington. Import grains currently moved by truck from Wilmington to the Warsaw area would be handled by CSXT. The Wilmington Terminal Railroad (WTRR) would switch grain cars within the Port and assemble unit grain trains on Port property. CSXT locomotives would pick up the loaded unit train, travel north to the Wallace/Warsaw area, and deliver the train to its intended industry location. Under ideal circumstances, this same crew could return an empty unit train to the Port for reloading. Import or export unit grain trains destined or originating much farther inland, possibly the Midwest, would travel via the W&W Subdivision and Richmond. CSXT would also serve any potential new industries that may locate on the restored segment or north of Wallace. All of the positive values created by a reopening are fully within the operational capability of CSXT, and unity of control and mutually supporting business objectives make this option attractive.

Operation by a Short Line Operator

Another scenario for operation of the restored segment would be to use a short line rail operator, possibly the WTRR. The following discussion has assumed that the WTRR would be the short line operator for the restored corridor. WTRR locomotives and crews would depart the Port with unit grain trains and use CSXT trackage to deliver the train to CSXT at Wallace or Warsaw or another location on either the restored segment or on the existing CSXT segment. Operation using this scenario would require negotiations with NCDOT and CSXT to possibly grant overhead trackage rights to the WTRR to a designated interchange point. Under this arrangement, the WTRR would pay a wheelage charge to CSXT based on the number of cars handled. Typically, the owning railroad (CSXT) would not normally grant rights to a tenant (WTRR) to receive or deliver freight cars to on-line customers on the owned line. However, the situation with the restored line is not a typical one, since NCDOT owns and controls the corridor. Details of switching and trackage rights would need to be negotiated in an operating agreement as discussed previously. These use arrangements must all be sorted and balanced on a business and operational basis in a new operating agreement that would support this scenario. Use of the WTRR would enhance many of the new business opportunities for the Port to include the grain shuttle and other import and export grain opportunities. The scenario also is potentially attractive to CSXT for reducing the amounts of switching service they provide as compared to line-haul.

A modification of this scenario for operation of the restored segment could involve the WTRR assuming all rail operations in the Wilmington area east of Davis Yard. CSXT and the WTRR have had conversations regarding this potential arrangement in the past, but formal negotiations were never progressed. It is not known if the CSXT and the WTRR would want to reconsider this. Under this scenario, Davis Yard would be the CSXT/WTRR interchange point for Wilmington area freight still arriving from the west and south. CSXT would not operate east of Davis Yard, except possibly to the CP&L Sutton coal plant. The WTRR would deliver and pick up cars from CSXT at Davis Yard. The WTRR would then service all local industries as well as

the Port. CSXT would still retain service on the Malmo Spur including to the USA Railroad interchange at Leland.

Assuming that an agreement between the State, CSXT and the WTRR could be reached for operation by WTRR on the restored corridor, the WTRR would operate the unit grain shuttle train directly from the Port and deliver the train to a CSXT interchange at Wallace or at another point further north. CSXT would in turn deliver empty unit shuttle grain trains back to the WTRR in the Wallace area, along with any other CSXT freight shipments coming on this route destined for Wilmington. This would also include loaded unit grain trains for export if this business were to indeed materialize.

Figure 2.3
One of the three typical Wilmington Terminal switch engines.

Any increased rail service by the WTRR would require additional capital investments and substantial expansion of its operational capabilities if this sub-scenario were to be implemented. The WTRR currently operates a fleet of only three switch engines that adequately serve its present needs. Expanded operations could lead to the need for the WTRR to expand its locomotive fleet (switchers and road engines) and additional management, operating and maintenance staff. The special opportunities scenario in Chapter 5 for the highly promising grain shuttle from the Port to Wallace/Warsaw would require investment in a fleet of covered hopper cars. Capital investments have been a perennial issue for the NCSPA and must be included in further economic feasibility analyses. Since the WTRR does not own any trackage, NCSPA also would be responsible for expansion of State-owned track infrastructure at the Port.

The advisability of implementing a short line strategy to support a reopening must be left open at this stage of the feasibility study process. The factors, pro and con, and the potential cost-savings and efficiencies that could accrue as a mutual benefit to the stakeholders must be included as a major consideration in future phases and be recognized as a necessary, possibly critical part of an ultimate financing plan. CSXT will have to be an integral part of the final decision process.

3. Restoration of the Wallace to Castle Hayne Rail Corridor

In the mid 1980s, CSXT made a business decision to abandon a portion of their W&W Subdivision between Wallace at about Milepost AC-208.07 to Castle Hayne at about Milepost AC-235.17. CSXT removed the track structure southward from about Milepost AC-208.42 to Milepost AC-235.17. In 1994, NCDOT assumed control of the CSXT right-of-way between Milepost AC-208.07 and AC-235.17. Approximately 1850 feet of former CSXT trackage is in place on the NCDOT-controlled portion of the corridor in Wallace between Milepost AC-208.07, just north of the Main Street/SR 42 crossing, and Milepost AC-208.42, just south of the Hall Street crossing. CSXT currently does not operate south of Milepost AC-208.07. NCDOT assumed control of the abandoned corridor in 1994. Figures 3.1 and 3.2 show the location of the abandoned corridor that is being considered for restoration.

3.1 Existing Corridor Conditions

When CSXT abandoned the Wallace to Castle Hayne segment, the track structure including rail, ties, and ballast were removed. The depth of removal of the bottom ballast layer varies widely between locations. In general, the railroad subballast layer was left in place. Track was removed at highway crossing locations and replaced with asphalt. A number of under-track pipe culverts were removed in order to improve drainage at selected locations. Several larger concrete arch culverts remain intact. At some locations, adjacent property owners have encroached on the former right-of-way. In general, the majority of the corridor has not been maintained and has reverted back to native vegetation. The rail corridor is 130 feet wide for most of the distance between Wallace and Castle Hayne, but a small number of parcels of property have been sold.

A total of five (5) railroad bridges over waterways were completely removed at the time the track was removed. At the Rockfish Creek bridge just south of Wallace at MP AC-209.3, the steel and concrete spans were removed, but the stone abutments and piers were left in place. The swing bridge over the North East Cape Fear River just north of Castle Hayne at Milepost AC-234.5 was opened and locked in place to allow the unimpeded flow of river traffic. The operating control systems were ultimately removed from this bridge.

Figures 3.3 through 3.6 illustrate general corridor conditions at selected locations. Appendix A contains track charts of the former trackage. It should be noted that a detailed inspection and inventory of former structures and culverts was not performed as part of this Study.

Insert Figure 3.1

Insert Figure 3.2

Figure 3.3
Looking north at Castle Hayne at existing end of track at about MP AC-235.2. This photograph was taken from the crossing at Holly Shelter Road.

Figure 3.4
Looking north off the US 117 overpass just south of Rocky Point at about MP AC-230.9.

Figure 3.5
Looking north at the former Ashton Road crossing between Rocky Point and St. Helena at about MP AC-226.7.

Figure 3.6
Looking south in Watha at about MP AC-214.5.

Figure 3.7
Looking south at existing end of track just south of the Hall Street crossing in Wallace at about MP AC-208.4.

Figure 3.8
Looking south at the Boney Street crossing in Wallace. Track remains in place but is not in service at this location.

3.2 Restoration of the Wallace to Castle Hayne Rail Corridor

For purposes of this Study, HDR completed a visual inspection of the abandoned corridor with staff from the NCDOT Rail Division Engineering and Safety Branch. Prior to beginning the actual restoration of trackage between Wallace and Castle Hayne, a number of administrative and engineering issues must be addressed.

In October 2002, the NCDOT Rail Division completed an "Environmental File Screening for Rail Improvements and Port Study" for the abandoned corridor. A more detailed Environmental Assessment or an Environmental Impact Statement may be required as part of the restoration process. A number of issues must be resolved with CSXT including potential financial participation and agreements, method of operation of the restored corridor, and coordination for design engineering and construction.

Prior to proceeding to engineering design, the following work tasks must be performed:

- Obtain extensive field survey information for the corridor.
- Research existing utility agreements and field locate all utilities that cross the right-of-way.
- Research and identify property and right-of-way boundaries. Resolve encroachments and acquire property if required.
- Perform an inventory and inspection of all existing pipe culverts and arch culverts.
- Perform a detailed structural inspection and evaluation of the existing stone piers and abutments at the Rockfish Creek Bridge.
- Perform a detailed structural inspection of the Northeast Cape Fear River Bridge.
- Conduct geotechnical investigations at all bridge locations.
- Conduct geotechnical investigations at selected locations along the right-of-way to determine usable limits of the former track bed.

Engineering design for track, structures, crossing signals, drainage, and roadway work at grade crossings must be completed, as well as obtaining all required federal, state and local permits. The following sections detail HDR's recommendations for infrastructure work that will be required to restore the corridor to active freight train service.

For purposes of this Study, the track structure has been assumed to be restored to FRA Class 3 standards that would allow freight train speeds up to 40 mph. Passenger train operations, although not considered as part of this Study, could conceivably operate at speeds up to 59 mph. Train control signals (i.e. centralized traffic control or automatic block) are assumed to not be required as part of the initial restoration of the corridor to freight service. The restored corridor would operate without signals, i.e. dark territory using standard CSXT operating rules. The CSXT rail lines that connect on either end of the corridor are not signalized, and the projected line tonnages would not justify the expense of signals. Using a conservative estimate of approximately $250,000 per mile for coded track for a signal system, the cost for signals for the restored 27.1 mile portion alone could be about $6.8 million, plus contingencies. In addition, the

cost to add signals to the existing CSXT connecting portions must also be considered. HDR recommends that train control signals not be part of the initial restoration.

The following sections describe the work that would be required to restore the Wallace to Castle Hayne segment to active freight rail service. A summary order-of-magnitude cost estimate for the restoration is included at the end of this Chapter. A detailed estimate is included in Appendix B.

3.2.1 Track Structure and Drainage

The main line track would be restored using new timber ties and a minimum acceptable rail size. HDR recommends using current CSXT track standards for construction of new railroad track. These standards would include:

- The use of 141# welded rail
- Overall roadbed width to extend 15′ from either side of the centerline of the track for a total width of 30′, with ditches beyond roadbed limits
- Subballast depth to be 6″ over the 30′ roadbed width
- Track ballast depth to be 8″ below bottom of tie with ballast even with top of tie

Prior to laying new track, we have assumed that the entire corridor must be cleared and grubbed for a width of approximately 50′. It is assumed that approximately 6″ of unsuitable material must be removed for a width of 30′ prior to placing a new 6″ subballast layer. It is anticipated that restoration of the track can be accomplished within the limits of the 130′ wide rail right-of-way, with only minimal property acquisition required.

For purposes of this Study, we have assumed that a single 10,000′ passing siding would be built at a location to be determined at a future date. Due to the grading work that would be required for a new siding, property acquisition may be necessary. Consideration would be given to using No. 15 spring-operated turnouts with approach signals for a new siding. The use of spring switches would increase the efficiency of operations since train crews would not have to walk the length of their train to restore switches for main line movements. These turnouts could be upgraded to remote control operation if a signal system were to be installed at a later date. For estimating purposes, we have assumed that five new rail-served industries would locate on the restored corridor. Hand operated No. 10 turnouts would be used for these industries. Constructing new trackage to serve these industries would be the responsibility of each individual industry; costs for industry trackage have not been included.

The former valuation maps and track charts indicate the locations of numerous under-track culverts. A detailed inspection and inventory of all existing drainage structures would need to be performed as part of the design process. Some of these former culverts may have been removed to improve drainage across the corridor. The existing and former portions of the W&W Subdivision have historically been prone to have washouts, especially during hurricane events. Hydraulic and hydrologic studies will need to be performed to ensure that existing culverts are still adequate for present conditions. Locations where culverts may have been removed would

also need to be analyzed to ensure that new replacement culverts are sufficiently sized for current drainage conditions and design storm events. For purposes of this Study, we have assumed that all existing reinforced concrete pipe culverts and cast iron pipe culverts under the track are adequate and would be simply cleaned out as part of the track restoration. All existing terra cotta and corrugated metal pipe under the track would be removed via open cut and replaced with reinforced concrete pipe prior to restoring the track structure. At crossing locations where corrugated metal or terra cotta pipes are (or were) present parallel to the track and under the roadway, the existing pipes would be removed and replaced with corrugated metal pipe. Existing concrete and brick arch culverts have been assumed to be adequate and would require only minor rehabilitation.

3.2.2 Highway/Railroad At-Grade Crossings

A number of highway/railroad at-grade crossings existed when CSXT removed the track structure. Appendix C contains a listing of the former crossing locations. The crossing locations were simply filled in with asphalt at that time. As part of the overall environmental permitting process, all former crossing locations must be evaluated for restoration. A detailed Traffic Separation Study (TSS) should be conducted as part of the overall environmental process for the corridor restoration. The TSS would identify former crossing locations that could possibly not be reinstated, i.e., roads would be closed where they now cross the abandoned corridor which thus eliminates the need for a new "crossing". The TSS would also identify potential new grade separation structure locations. It is anticipated that a number of former crossing locations may be consolidated with other crossings, thus resulting in the restored line having fewer crossings than the original line. Crossing consolidation should be considered for the multiple crossing locations in Wallace and Burgaw. A comprehensive public information program must be implemented by NCDOT prior to the startup of new train service in order to alert the local motoring public that train service will be restored. Operation Lifesaver exhibits (and possibly a train) could be used to visit on-line communities to make them aware of grade crossing safety issues.

For purposes of this Study, we have assumed that crossings would be reinstalled at all former public and private crossing locations. A total of 30 public and 24 private at-grade crossings would be restored to service. This includes complete replacement of the existing crossings in Wallace that are located in the out-of-service portion of the track that is in place from just north of Main St./NC 41 to just south of Hall St. All public crossings have been assumed to be restored with a 30' roadway width with the exception of the Main St./NC 41 crossing in Wallace which is 45' wide. Crossings of major state highways would be restored with full-depth concrete crossing services. Concrete surfaces are recommended for the crossings at Main St./NC41 in Wallace, NC 11 near Watha, Wilmington St./NC 53 in Burgaw, and NC 210 in Rocky Point. All other public crossings would be restored with asphalt surfaces with standard CSXT rubber flangeways. Private crossings would be restored with a 12′ width with asphalt surfaces with standard CSXT rubber flangeways.

All restored public crossings would be protected with automatic warning devices (AWDs) consisting of gates, flashers, and bells. Additionally, a number of crossing locations would require cantilevers due to specific site geometry. Cantilevers would be required at the crossings

at Main St./NC41 in Wallace, Wilmington St./NC 53 in Burgaw, and Fremont St. in Burgaw. It should be noted that the AWDs remain in place at the Main St./NC41 crossing in Wallace; the track is in place at this crossing but is not in service. Private crossings would be protected with crossbucks.

Figure 3.9
Looking north at the Main St./NC41 crossing in Wallace. The automatic warning devices are in place. The track has been cut just north of the crossing.

Just south of Burgaw, an existing US 117 overpass crosses the abandoned corridor. It is anticipated that this grade separation would remain. No new grade separation structures are proposed at this time.

3.2.3 Bridges

The current "Manual for Railway Engineering" published by the American Railway Engineering and Maintenance of Way Association (AREMA), as well as current CSXT standards and guidelines, would be used for design of bridge replacement structures and rehabilitation. New structures would be designed to accommodate 286,000 lb. axle loadings.

Actual bridge lengths and types would be finalized during the design process. Hydraulic and hydrologic studies will need to be performed to ensure that the channel openings for proposed bridge structures are adequate for present drainage conditions. It may be possible to replace some of the former structures with large cast-in-place concrete box culverts, but this would be determined during the design process. For purposes of this Study, it is assumed that former railroad bridges would be replaced with comparable new bridge structures. The following table indicates the locations of railroad bridges that would be restored in order to reopen the line.

Table 3.1

Milepost	Waterway Name	Former Length and Type	Proposed Length and Type
AC-208.9	None	70′ Timber Open Deck Trestle	82′ Prestressed Concrete Trestle: 2 spans @ 30′, 1 span at 20′
AC-209.3	Rockfish Creek	316′: 6 Deck Plate Girder Spans and 1 Concrete Slab Trestle	320′ Steel Deck Plate Girders: 5 Spans @ 60′, 1 span @ 20′
AC-220.2	Burgaw Creek	90′ Timber Ballasted Deck Trestle	92′ Prestressed Concrete trestle: 3 spans @ 30′
AC-228.8	None	30′ Timber Ballasted Deck Trestle	56′ Prestressed Concrete Trestle: 3 Spans @ 18′
AC-229.2	None	30′ Timber Ballasted Deck Trestle	56′ Prestressed Concrete Trestle: 3 Spans @ 18′
AC-231.2	None	16′ Concrete Slab Trestle	24′ Prestressed Concrete Trestle: Single Span
AC-234.5	Northeast Cape Fear River	400′: 6 Deck Plate Girder Spans and 1 Movable Deck Plate Girder Span	Rehabilitate Existing Bridge and Restore Operating Control Systems

The five former timber and concrete trestles were completely removed when the track structure was removed. These structures would be replaced by constructing standard CSXT prestressed concrete trestle (PCT) spans with ballasted decks. The substructure for each bridge would be designed based on site-specific geotechnical information that would be obtained as part of the design process. The PCT spans have been pre-designed by CSXT and are readily available from a number of precast concrete suppliers. This type of structure would be the most cost effective for these five locations.

At the Rockfish Creek Bridge, the steel and concrete spans were removed, but the stone abutments and piers were left in place. Based on past experience in similar situations, HDR recommends that a detailed structural inspection and evaluation of the stone piers and abutments be conducted to determine if these existing substructure elements could be economically rehabilitated and reused to support new steel spans. For purposes of this Report, HDR has assumed that the existing stone abutments and piers could be rehabilitated, not replaced. New open deck plate girder spans would be placed on the rehabilitated substructure.

Figure 3.10
Former timber trestle location just south of Wallace at MP AC-208.9.

Figure 3.11
Existing stone pier at the former bridge over Rockfish Creek MP AC-209.3.

At approximately MP AC-230.9, a 2-lane U.S. Highway 117 overpass crosses the abandoned corridor. The existing horizontal clearance is approximately 15′ from the former centerline of track to the face of existing piers. The vertical clearance is unknown. This bridge is not currently programmed for replacement by NCDOT. Since the distance between the centerline of track to the face of the existing piers is less than the 25′ recommended by AREMA and CSXT, the existing piers should be retrofitted with concrete crash walls. When a replacement structure is programmed to be built at a future date, it should provide a minimum 25′ horizontal clearance and 23′ vertical clearance. The cost of a new highway bridge structure is not considered as part of this Study.

The swing bridge over the North East Cape Fear River will present the largest engineering challenge of the entire restoration project. The bridge was completely rebuilt in the late 1940's. At that time, the existing abutments and one pier were rehabilitated and retained; six new concrete piers were installed. One of the existing deck plate girder spans from the original structure was rehabilitated and retained in place. Five new deck plate girder spans were fabricated and erected. The 140′ movable span was fabricated in the early 1910s and formerly was in service at another location. This span was transported to the site, rehabilitated and erected. A 50′ deck plate girder span from another bridge was also rehabilitated and brought to this bridge for reuse. This span was also fabricated in the early 1910s. Appendix D includes a General Plan view of the existing bridge.

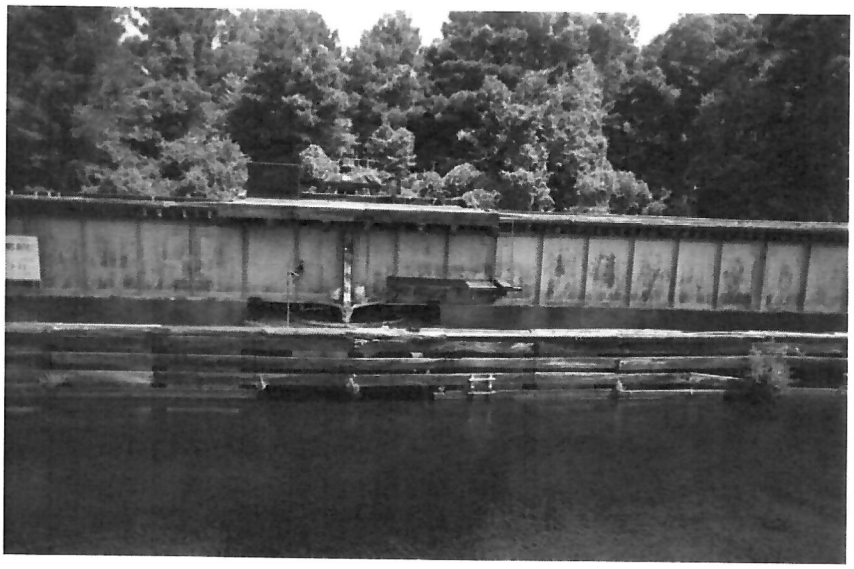
A detailed structural inspection of the North East Cape Fear River Bridge would need to be conducted as part of the design process to determine the amount of steel and concrete rehabilitation that would be required. The existing bridge spans would be re-rated for 286,000 lb. axle loads. The spans may require modification; these modifications could include building up the tops of the existing steel girders, Given the relatively recent (1947) bridge reconstruction and the low density of rail traffic on the line, HDR anticipates that only minor rehabilitation of the existing fixed steel spans and substructure would be required.

For purposes of this Study, we have assumed that the bridge would be restored to service utilizing a full-time on-site bridge operator who would physically control opening and closing the bridge to accommodate waterway and rail traffic. This initial step would be less expensive in terms of equipment but will require operators and maintenance efforts to allow the span to operate as desired. Sometime in the future, the span could be considered to be automated to remove the operator from the immediate site and allow remote control operation. This second step for possible future remote operation will be much more expensive than the cost of the operator in the short term. Costs for future remote operation have not been included in the cost estimate for this Study.

Restoring the bridge to service will require replacing the drive motors and operating mechanisms that were removed when the bridge was abandoned in the 1980s. All of the remaining operating equipment will have to be cleaned and relubricated prior to any attempt at operation. The existing machinery has been assumed to be able to be restored to operating condition without full component replacement. The first several rotations may be performed by tugging the end of the swing span to make sure everything is free before applying motor/engine force to the existing

components. Components will require additional greasing and flushing during the first couple of weeks to remove any moisture or debris accumulated over the years. After that, a routine maintenance program would be implemented.

Figure 3.12
Looking north standing on the south approach span of the Northeast Cape Fear River Bridge at MP AC-234.5. The open swing span and the north approach spans are visible.



The operator's house formerly located at the southeast quadrant of the bridge has been removed. This house would have to be replaced to provide a location for the operating equipment. It is not known whether the former prime mover was electric, diesel or propane fired. For restoration purposes, we have assumed that commercial power would be available and electric drive components would be used. An option would be to install an electrical generator and run power to a small motor installed on the bridge. To minimize the cost, a small motor is recommended. The faster the time of swing span operation, the more expensive the restoration cost will be. In addition, decreasing the time of operation by half will increase the cost of the components by as much as 3 or 4 times the cost of the slower time. To keep the costs down, a swing time of 5 or 6 minutes would be recommended. Additional motors or equipment may be required to operate the swing span wedges and locks. These devices may be manual at this point. New rail joints would be required. The FRA may also require the installation of span locks.

The United States Coast Guard will require notification of the span being restored to operation; the USCG would require electric or battery operated navigation lights. Close coordination with the Coast Guard would be required whenever the movable span is tested and turned.

A number of other factors will also need to be considered. Derails would be required on either side of the swing span that would be either manually or electrically operated. The structure was

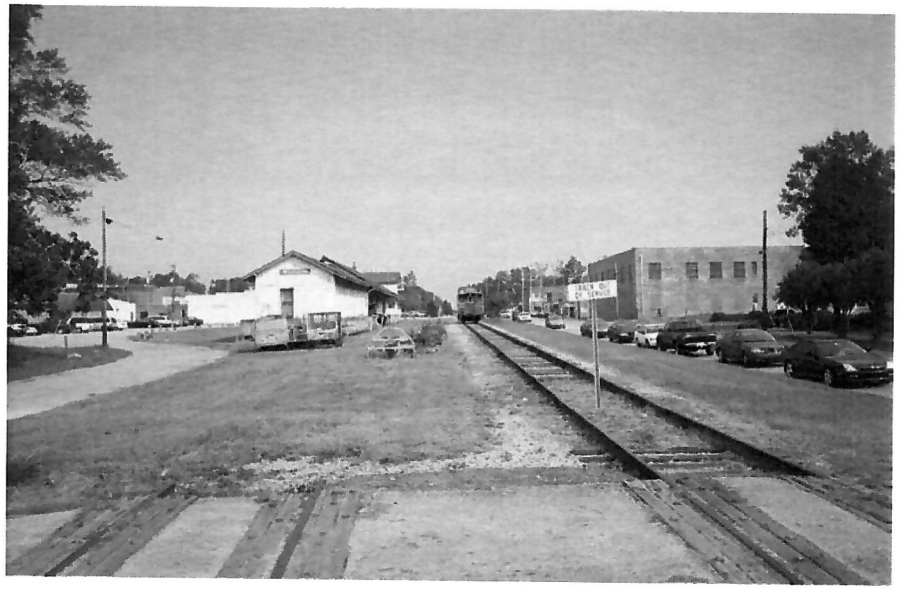
last painted in 1959; lead based paint on the structure would need to be removed and the structure repainted. New bridge ties and rail would need to be installed. The bridge may have sagged to some extent (structural creep) from being in the open position for such a long period of time. Adjustments may be required at the ends and the approaches to accommodate the current structure condition. The actual cost of restoration of the bridge could increase dramatically once the actual condition of the bridge is examined in detail.

3.2.4 Buildings

A number of former railroad buildings remain intact at a number of locations along the abandoned corridor. These buildings should not be impediments to restoring the track to active service. Each structure should be examined for ownership and potential historical significance as part of the environmental permitting process. Decisions on the ultimate disposition of the buildings would be made at that time. Two cabooses also occupy former locations of the main line; relocation of these cabooses would need to be done in order to restore active rail service.

Figure 3.8 shows the depot at Wallace and a caboose on the track that is in place. Additionally, a former freight house just south of the depot also remains in place. A caboose occupies the out-of-service track immediately adjacent to the freight house.

Figure 3.13
Looking north at the Cliff Street crossing in Wallace. The former freight house is on the left, with the depot immediately north of the freight house.



In Willard, the former depot building remains intact. The former depot in Burgaw also remains intact. A caboose occupies a short section of the track immediately adjacent to the Burgaw depot.

Figure 3.14
Looking south at the former depot in Willard, one block south of NC11.

Figure 3.15
Looking north at the former depot in Burgaw from Dudley Street.

3.3 Order of Magnitude Cost Estimate

The following table summarizes the anticipated order-of-magnitude capital costs for the initial restoration of freight train service for the Wallace to Castle Hayne Segment. These costs assume that all work would be performed by contractors, not by CSXT forces. Appendix B contains a detailed estimate. Appendix H contains a listing of assumptions used to develop this estimate.

Table 3.2

Wallace to Castle Hayne Restoration

Capital Cost Pay Item	Cost
Track	$24,883,800
Grade Crossings	$4,926,650
Train Control Systems	$0
Structures	$2,765,000
Drainage	$75,000
Utility Allowance	$100,000
Allowance for Right-of-Way	$80,000
Contractor Mobilization	$1,637,523
Design and Permitting	$3,275,045
Environmental Documentation	$500,000
Construction Management	$2,620,036
Contingencies	$6,566,090
Inflation Factor	$1,916,137
Project Total	**$49,345,281**

4. Improvements to Connecting CSXT Lines

As stated previously, CSXT was not an active participant for this Study. HDR's understanding of the CSXT physical plant and operations in eastern North Carolina is based on information provided by the NCDOT Rail Division. The discussion in this Chapter has been prepared mainly using track charts and old valuation maps for the CSXT lines.

For purposes of this Study, HDR has made general assumptions about the condition of the routes being considered. The order-of-magnitude cost estimates that have been prepared for this Study are to be used for general informational purposes only. Should CSXT become a more active participant at a later date, more precise estimates with a greater confidence level could be completed using input from CSXT Engineering Department staff. Information from CSXT that will help develop more precise estimates would include updated track charts, track maintenance records, movable bridge clearance information, bridge drawings, and bridge inspection reports. CSXT may decide to perform these estimates internally with CSXT staff.

4.1 W&W Subdivision: Contentnea to Wallace

The W&W Subdivision begins at about MP AC-139.0 in Contentnea and ends in Wallace at about MP AC-208.1. At Contentnea, the W&W Subdivision connects with CSXT's South End Subdivision, a double-track portion of the "A" Line. A power-operated turnout in the No. 2 main track directs trains to and from the single-track W&W Subdivision. Train operations on the W&W Subdivision are governed by Direct Traffic Control (DTC). This method of operation was described in Chapter 2.

Track

The following discussion relates to improvements to the existing track infrastructure. As discussed previously, a limited number of additional train movements would be diverted to this line as a result of a reopened Wallace to Castle Hayne line segment. It is beyond the scope of this Study to identify potential locations for new sidings and/or a second main track that may be deemed necessary to support the increased train movements. Subsequent project phases would address these issues.

From Contentnea to about MP AC-190.5 just south of Warsaw, the maximum authorized speed for freight trains is 40 mph. There is a stretch of 25 mph track between about MP AC-156.5 and AC-164.6. This speed restriction is due to a city ordinance in Goldsboro. Between Contentnea and MP AC-190.5 south of Warsaw, 132# and 136# welded rail is in place on wood ties. The track apparently is maintained at an adequate level to support the current train speeds. Since this portion of the route is an active freight corridor, HDR has assumed that no major capital investments for track or structures would be required to support the limited number of additional trains that could be present on this line due to a reopening.

From Warsaw MP AC-190.5 to Wallace MP AC-208.07, the maximum authorized speed for

freight trains is 25 mph. This segment contains wood ties and 100# jointed rail whose conditions are unknown. This line segment is essentially a low speed switching operation to serve the numerous feed mills and other industries in the area. In order to support increased train movements at a proposed speed of 40 mph, HDR recommends that the 100# jointed rail be replaced with the CSXT standard 141# welded rail. Additionally, it is assumed that a timbering program would need to be implemented in order to raise the track from FRA Class 2 to Class 3 standards. Twelve existing main line No. 10 turnouts along the segment would also require replacement.

Figure 4.1
CSXT switcher working south of Warsaw.
Photograph taken from Railroad Street.

Restoration of the Wallace to Castle Hayne segment will ultimately increase train traffic on the existing W&W Subdivision between Wallace and Contentnea. During future phases of this project, CSXT will examine the effects that these increased operations will have relative to existing passing siding capacities. CSXT may determine that some sidings would require extensions to accommodate longer trains. New siding locations may also be considered. CSXT may consider the potential use of spring switches for siding improvements. Spring switches would increase the efficiency of operations since train crews would not have to walk the length of their train to restore switches for main line movements. The costs of siding improvements on the existing CSXT W&W Subdivision have not been considered for this Report.

There are a total of 27 public crossings and six private crossings between Warsaw MP AC-190.5 and Wallace MP AC-208.07. AWDs are present at four of the 27 public crossings. The AWDs at these crossings would need to be upgraded to support the higher train speeds. Private crossings

are protected either with crossbucks or have no protection at all. For purposes of this Study, HDR has assumed costs only for AWD upgrades at four public crossings, since these upgrades would definitely be required for increasing train speeds. Costs for new AWDs at public crossings currently protected with crossbucks have not been included. Costs for upgrading grade crossing surfaces have not been included due to their unknown condition; however, HDR acknowledges that some crossing surface upgrades would probably be required. Should the project progress to future phases, NCDOT and CSXT would jointly identify the needs for grade crossing surface upgrades and other AWD upgrades.

Bridges

There are two existing timber ballasted deck bridges between Warsaw MP AC-190.5 and Wallace MP AC-208.07. They are located at Little Cabin Swamp (30′) at MP AC-199.5 and at Big Cabin Swamp (50′) at MP AC-200.4. For purposes of this Study, we have assumed that both timber trestles would be replaced with standard CSXT PCT's similar to the new structures proposed on the reopened segment.

Should CSXT be a more active participant at later phases of the project, more information would be available for bridges on the entire segment between Contentnea and Wallace. Bridge ratings could be performed at selected locations to determine potential upgrades to other bridges on the route.

Cost Estimate

Appendix E contains an informational order-of-magnitude cost estimate for the improvements described above for the CSXT W&W Subdivision between Warsaw MP AC-190.5 and Wallace MP AC-208.07. The total costs are estimated at $15,850,702.00. It is anticipated that more precise estimates will be developed during subsequent phases of the project with more CSXT participation.

4.2 Wilmington Subdivision: Hamlet to Davis Yard

The Wilmington Subdivision extends between about MP SE-254.1 near Hamlet and MP 356.8 at Davis Yard west of Wilmington. The maximum authorized speed for freight trains is 49 mph between Hamlet and Pembroke and 40 mph between Pembroke and MP SE-354.0 west of Davis Yard. There are permanent speed restrictions near Lumberton.

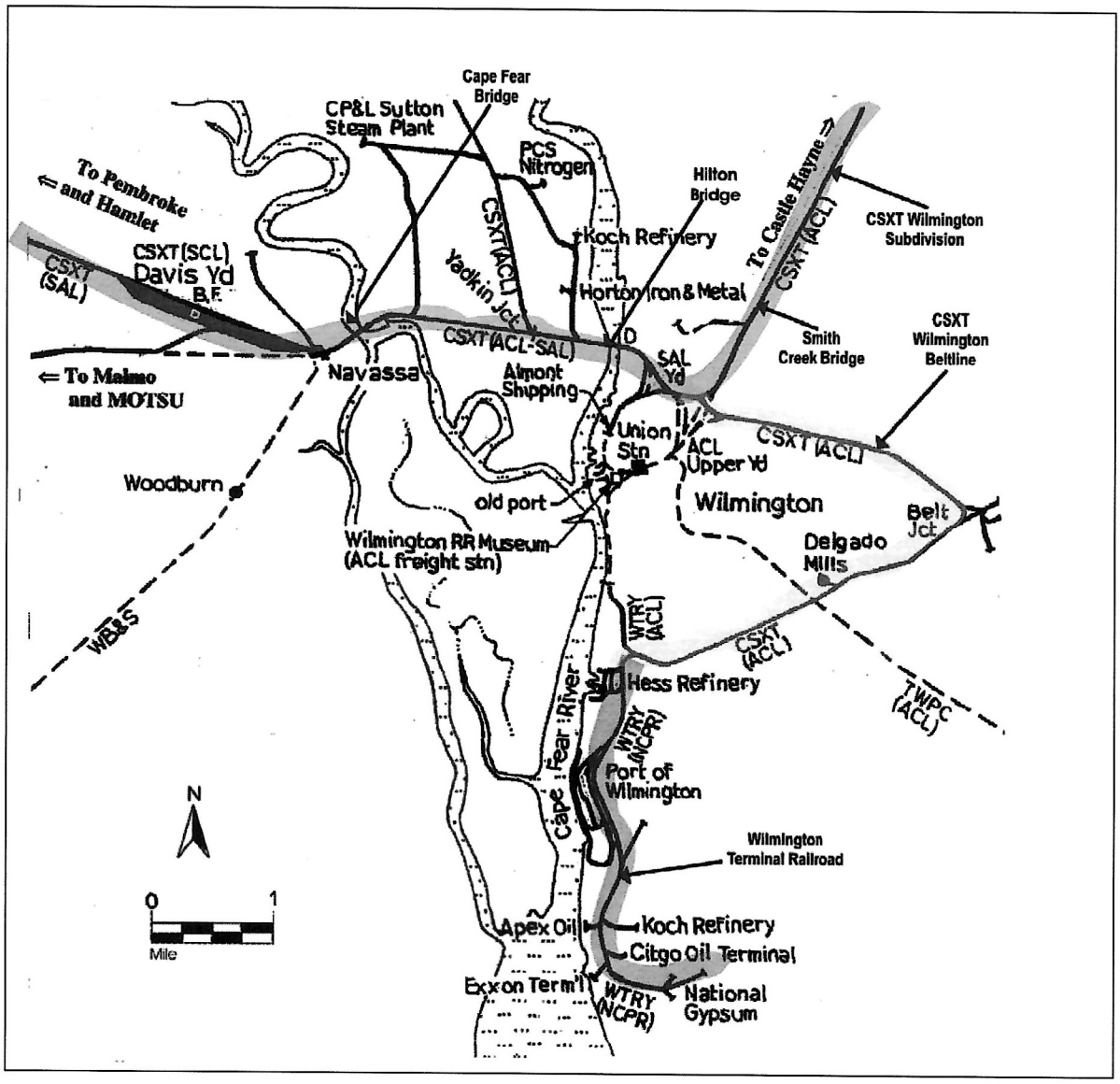
Since no additional trains or speed increases are proposed for the Wilmington Subdivision between Pembroke and Davis Yard, HDR has assumed that no capital improvements would be required on this segment as part of the effort to reopen the Wallace to Castle Hayne segment.

4.3 Wilmington Subdivision: Terminal Trackage from Davis Yard to Castle Hayne

Main line trackage within the Wilmington Terminal area extends from MP 356.8 at Davis Yard

to MP SE-371.7 at Castle Hayne. CSXT recently assigned former SAL mileposts to this trackage. MP SE 371.7 approximately equals the former MP AC-235.2 on the abandoned W&W Subdivision. Freight train speeds are limited to a maximum authorized speed of 10 mph on this line segment

Figure 4.2
Wilmington Area Rail Lines



Track

This segment contains wood ties with combinations of 90# and 100# welded and jointed rail whose condition is unknown. Near MP SE-364.1, the Wilmington Belt Line breaks off the main

line terminal trackage; the Wilmington Belt is described in more detail later in this Chapter. The proposed grain shuttle train and any other future direct train moves off the restored Wallace to Castle Hayne segment to the Port would use this trackage between MP SE-371.7 and MP SE-364.1. In order to support increased train movements at a proposed speed of 40 mph, HDR recommends that the jointed rail be replaced within these limits with the CSXT standard 141# welded rail. Additionally, it is assumed that a timbering program would need to be implemented in order to raise the track from FRA Class 1 to Class 3 standards. One new No. 10 turnout would be required to the industry spur at Castle Hayne. Two existing No. 10 main line turnouts at Castle Hayne would also require replacement.

HDR anticipates that train movements between MP SE-364.1 and MP 356.8 at Davis Yard would continue to be limited to 10 mph. Therefore, no track improvements have been proposed for this line segment. No improvements have been identified for the Cape Fear Bridge and the Hilton Bridge. These movable bridges have limited horizontal and vertical clearances but have not been considered for purposes of this Study.

Near MP SE-364.1, a new connecting track would be needed to connect the main line terminal track to the Wilmington Belt. The present track arrangement consists of only one switch and would not allow a southbound train traveling on the main line terminal track from Castle Hayne to connect directly to the Wilmington Belt to proceed to the Port. Based on aerial information provided by NCDOT, a connecting track approximately 2300 feet in length would be needed. Hand operated No. 10 turnouts would be used due to the site constraints in the area. Property acquisition needs are unknown and have not been considered for this Study.

Between MP SE-371.7 and MP SE-364.1, there are a total of eight public crossings and two private crossings. AWDs are present at all eight public crossings. The AWDs at these crossings would need to be upgraded to support the higher train speeds. Private crossings are protected either with crossbucks or have no protection at all. For purposes of this Study, HDR has assumed costs only for AWD upgrades at eight public crossings, since these upgrades would definitely be required for increasing train speeds. Costs for upgrading grade crossing surfaces have <u>not</u> been included due to their unknown condition; however, HDR acknowledges that some crossing surface upgrades would probably be required. Should the project progress to future phases, NCDOT and CSXT would jointly identify the needs for other grade crossing surface and AWD upgrades.

Bridges

At about MP SE-364.8 (former MP AC-242.3), the main line terminal track crosses Smith Creek. This bridge originally carried two tracks, but currently includes one track. The former west track was removed some time ago. The present bridge consists of a 38′ timber open deck approach trestle on the north; a 181′ through truss over the waterway supported on stone piers; and a 40′ timber ballasted deck approach trestle on the north. The truss span dates to 1907 and apparently replaced a portion of the previous bridge that was constructed in the 1890s. The truss span has limited horizontal and vertical clearances.

In order to sustain increased train operations and provide better clearances, the Smith Creek Bridge may be considered for replacement. Site-specific geotechnical information would be obtained as part of the design process in order to design new substructure elements. A detailed structural inspection and evaluation of the two existing stone piers would be conducted to determine if they could be economically rehabilitated and reused to support new steel spans. Detailed survey information would need to be obtained for the existing bridge before a final bridge configuration can be determined.

For purposes of this discussion, a proposed new bridge could consist of:

- 2-50' prestressed concrete trestle (PCT) approaches on each end. Each approach will consist of two spans.
- 2-90' through deck plate girder spans over the waterway

For purposes of this Report, HDR has assumed that the single steel truss span would be removed and replaced with two new 90' through plate girder spans. The steel spans would have concrete ballasted decks. The two existing stone piers that currently support the truss would be rehabilitated, not replaced. A new pier would be constructed between the existing ones to support the ends of the new spans in the middle of the waterway.

The PCT approach spans would be similar to the ones proposed for the new bridges on the restored line segment as discussed in Chapter 3. These PCT's have been pre-designed by CSXT and are readily available from a number of recast concrete suppliers. This type of structure would be the most cost-effective for the approaches.

Construction staging will be a key component of the design so that train operations would continue during construction, with track outages and train curfews required for the installation of major bridge components. Permitting for the new bridge will also be a major part of the design effort for a new structure.

Cost Estimate

Appendix F contains an informational order-of-magnitude cost estimate for the improvements described above for the Wilmington Subdivision main line terminal trackage between Castle Hayne at MP SE-371.7 and a point north of downtown Wilmington at MP SE-364.1. The total costs are estimated at $11,097,045.00. It is anticipated that more precise estimates will be developed during subsequent phases of the project with more CSXT participation.

4.4 Wilmington Terminal: Wilmington Belt Line

At a point north of downtown Wilmington east of McRae St., the Wilmington Belt Line breaks off the main line terminal trackage near MP SE-364.1. This junction is located near the former site of the ACL Upper Yard. The Wilmington Belt uses former ACL mileposts, beginning near MP ACB-244.0 (approximately equals MP SE-364.1) and extends southeast to Belt Junction

(also known as Fernside) near MP ACB-246.7. At Belt Junction, the track turns to the southwest and proceeds toward the Port of Wilmington. CSXT trackage ends and WTRR trackage begins at about MP ACB-249.7 between the Third St. and Second St. road crossings, northeast of the Port. The WTRR operates on State-owned trackage beyond this point to the Port and local industries. Freight train speeds are limited to a maximum authorized speed of 10 mph on the Wilmington Belt.

Track

The line segment between the junction at MP SE-364.1/ACB-244.0 and Belt Junction at MP ACB-246.7 contains wood ties with 132# and 100# welded rail whose condition is unknown. The line segment between Belt Junction at MP ACB-246.7 and the end of CSXT trackage at MP ACB-249.7 between the Third St. and the Second St. contains wood ties with 85# jointed rail whose condition are unknown. The proposed grain shuttle train and any other future direct train moves off the restored Wallace to Castle Hayne segment to the Port would use this trackage. Since this trackage is in an urban environment, future train operations are not expected to exceed 25 mph. HDR does not recommend rail replacement for the segment between the junction at MP ACB-244.0 and Belt Junction at MP ACB-246.7. HDR recommends that the 85# jointed rail be replaced with the CSXT standard 141# welded rail between Belt Junction at MP ACB-246.7 and the end of CSXT trackage at MP ACB-249.7. Additionally, it is assumed that a timbering program would be needed for the entire Wilmington Belt Line between MP ACB-244.0 and ACB-249.7. Five existing No. 10 main line turnouts on this line would also require replacement.

Due to the high number of grade crossings on the Wilmington Belt Line, a Traffic Separation Study (TSS) should be performed prior to track upgrading. A TSS would identify potential crossings that could be closed or grade separated. On this 5.7-mile line segment, there are a total of 23 public crossings and two private crossings. Eleven of these crossings are located in approximately the last mile between 17th Street and Third Street. The presence of long slow-moving freight trains and resultant traffic delays on the large number of crossings on this route has been a cause of great public concern for some time for the local community. AWDs are present at 14 of the public crossings. The two private crossings are protected by crossbucks or have no protection at all. The AWDs at these crossings would need to be upgraded to support the higher train speeds. Private crossings are protected either with crossbucks or have no protection at all. For purposes of this Study, HDR has assumed costs only for AWD upgrades at 14 public crossings, since these upgrades would definitely be required for increasing train speeds. Costs for upgrading grade crossing surfaces have <u>not</u> been included due to their unknown condition; however, HDR acknowledges that some crossing surface upgrades would probably be required. Should the project progress to future phases, NCDOT and CSXT would jointly identify the needs for other grade crossing surface and AWD upgrades.

Bridges

There are two existing timber open deck bridges within this segment of the Wilmington Belt. They are located at Mill Creek (90′) at MP ACB-244.4 and at another crossing of Mill Creek

(30′) at MP ACB-247.3. For purposes of this Study, we have assumed that both timber trestles would be replaced with PCTs similar to the new structures proposed on the reopened segment.

Cost Estimates

Appendix G contains an informational order-of-magnitude cost estimate for the Wilmington Belt Line improvements described above. The total costs are estimated at $4,613,071.00. It is anticipated that more precise estimates will be developed during subsequent phases of the project with more CSXT participation.

4.5 Summary of Order-of-Magnitude Cost Estimates For CSXT Improvements

Table 4.1 summarizes the potential order-of-magnitude capital costs for the various improvements described in this Chapter. As discussed previously, CSXT had no input to these estimates. These estimates are provided for informational purposes only and are based on the construction work described being done by an outside contractor, not by railroad forces. Appendices E, F, and G contain the detailed estimates. Appendix H contains a listing of assumptions used to develop these estimates.

Table 4.1

CSXT Line Segment	Cost
W&W Subdivision - Contentnea to Warsaw	$0
W&W Subdivision - Warsaw to Wallace	$15,850,702
Wilmington Subdivision - Pembroke to Davis Yard	$0
Wilmington Subdivision - Davis Yard to Castle Hayne	$11,097,045
Wilmington Subdivision - Wilmington Belt Line	$4,613,071
CSXT Project Total	**$31,560,818**

5. Economic Analysis

5.1 Introduction

The overall objective of this Study is to provide and test a "Proof of Concept" that will examine the feasibility of reopening the Wallace to Castle Hayne rail segment. Previous Chapters of this Report addressed various railroad operational and infrastructure issues to include capital cost estimates. This Chapter will build on information already presented and will summarize the analysis of the economic feasibility of reintroducing rail service between Wallace and Castle Hayne.

Improved rail operations due to the rehabilitation of the Wallace to Castle Hayne line segment would not only increase efficiency and reduce costs of existing operations, but also provide opportunities for expansion of rail service and enhancement of regional business opportunities. These potential savings and enhancements were divided into five areas for evaluation:

1. Reduced operating costs for existing and forecasted growth of current rail service.
2. Incremental increases in existing rail traffic.
3. New rail and Port opportunities through expanded cargo handling or expansion of new industries.
4. Location of new industries on the reopened line segment.
5. Improved access to the Military Ocean Terminal at Sunny Point (MOTSU), a Department of Defense (DOD) Facility operated by the U.S. Army.

The results are summarized in a benefit-cost analysis showing whether or not the benefits to society in terms of improved economic development potential and increase employment and incomes outweigh the cost of reconstructing the line to allow resumption of rail service.

Economic benefit that will accrue from restoration of the Wallace to Castle Hayne segment of the former CSXT W&W Subdivision was determined from the analysis of rail operating improvements. Operating systems and new rail access define the operating costs, service levels and new business opportunities. Operating improvements and improved access for the region's industries become the basis for economic feasibility.

For the purposes of economic analysis, it was assumed that restoration would occur in 2005. Impacts were projected through 2025. Total impacts and average annual impacts refer to the 2006 to 2025 period. Unless otherwise stated, figures are in 2002 dollars. However, recognizing the volatility of rail rates and the complexity of required calculations, no attempt was made to adjust rail revenue data to the project year.

The economic analysis began with evaluation and projection of base rail activity in the region using existing railroad route configurations. This base forecast was compared to operations that would likely occur with restoration of the line segment. This evaluation included calculation of cost savings for existing traffic, estimation of incremental increases in traffic, identification of potential new activity as a result of improved service, and the potential for location of rail dependent industries on the new line segment.

Based on operational savings and service improvements, specific scenarios were created to describe the various schemes and business-potentials found applicable to the economic analysis focus areas. These included reduced costs for existing rail traffic, increases in rail traffic, new rail and port opportunities, expansion of existing industries, and development of new industries.

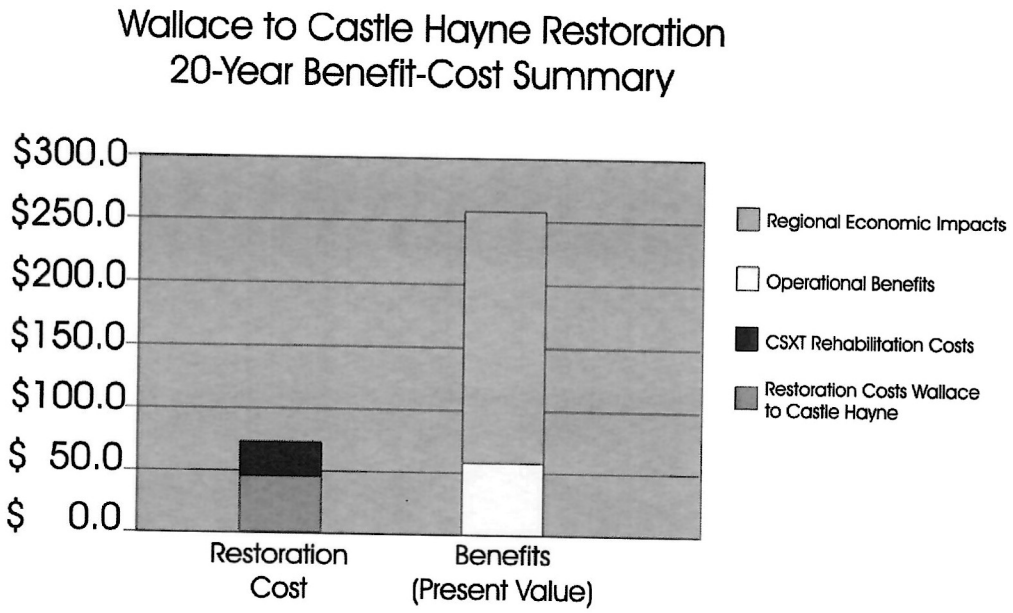
Based on estimated changes in operations and expansion of rail dependent industrial activities the economic benefits to the region and the State were calculated. These included operational saving and revenue growth for the railroad, impacts of new construction, increased employment in transportation industries, and expansion of other regional industry. The IMPLAN economic analysis model was used to evaluate impacts on employment, income, and tax bases. Operational and economic impacts were then compared to the cost of reopening to determine net economic benefits of reopening.

5.2 Summary of Benefits

As illustrated in Figure 5.1, this analysis found that economic benefits of reopening the line significantly exceed the required construction costs:

- Restoration costs for the Wallace to Castle Hayne segment are estimated at about $49.3 million.
- Costs of potential improvements to connecting CSXT lines are estimated at about $31.6 million.
- Operational savings to the railroad are estimated at $32.0 million over the 20-year planning horizon and net revenue gains were estimated at $32.3 million for a total of about $64.3 million in total benefits to the railroad.
- Considering only operational benefits to the railroad yields a benefit-cost ratio of only 0.81 to 1, indicating that from a purely operational standpoint the project is not economically feasible.
- Regional economic development benefits, reflected in new employment and growth in personal income, were estimated at about $195.5 million.
- Considering both operational benefits to the railroad and regional economic development benefits yields a positive benefit cost ratio of about 3.2 to 1.

Figure 5.1

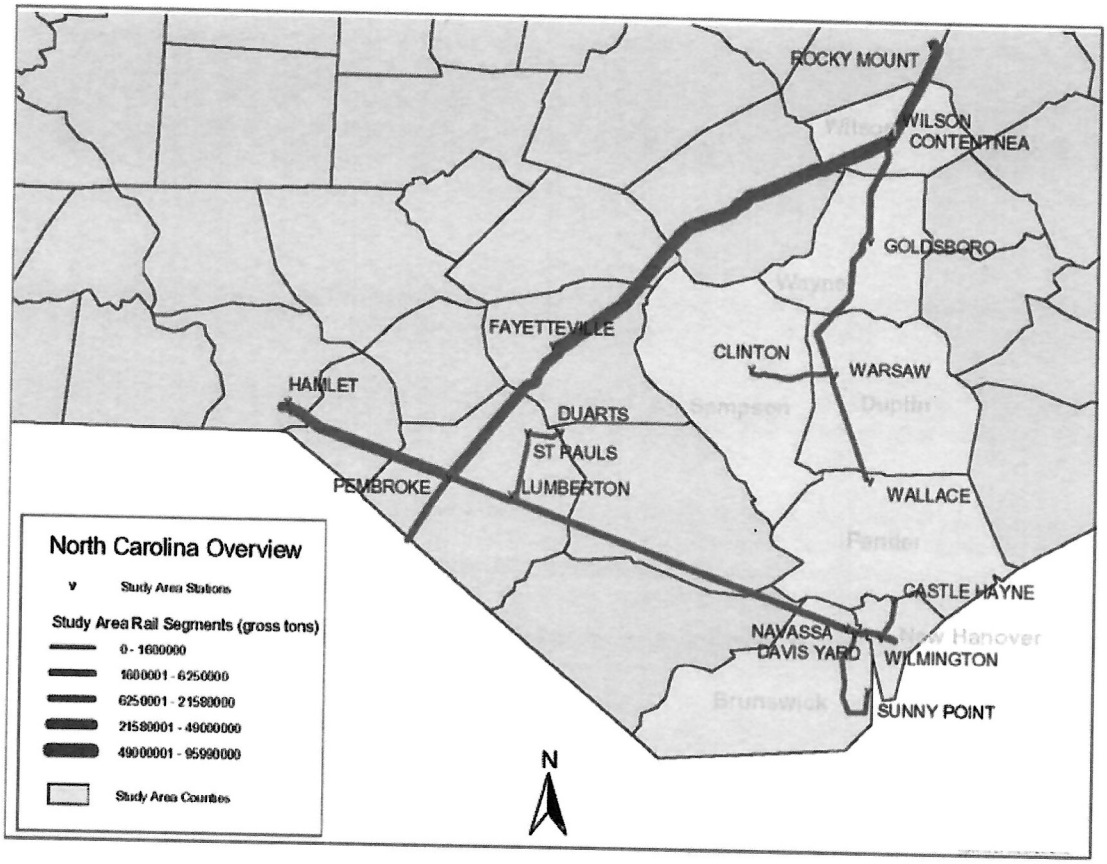


There are two limitations that must be recognized. First, all analysis is based on twenty-year forecasts and is sensitive to changes in markets and to changes in the railroad's cost structure. CSXT could reach much different conclusions through its own analysis. Second, while economic benefits exceed costs, they do not result in a specific cash flow directly accessible for financing the rail restoration and improvements to existing rail facilities. Therefore, the issue of financing the improvements still remains.

5.3 Base Projections

Economic analysis of the restoration of the Wallace to Castle Hayne segment begins with a review of base operations under existing line configurations. Figure 5.2 is a generalized map of the area showing the CSXT routes being considered. The Wilmington Subdivision extends from Hamlet through Pembroke and Lumberton to Wilmington and north to Castle Hayne, where it terminates. This line carried approximately 16.7 million gross tons in 2001. The Malmo Spur extends from Davis Yard to the interchange with the U.S. Army railroad (USA) at Leland. The USA then operates over its own trackage to MOTSU. Most of the traffic on the Wilmington Subdivision is switched out of Hamlet Yard.

Figure 5.2
Southeastern NC Area Rail Traffic

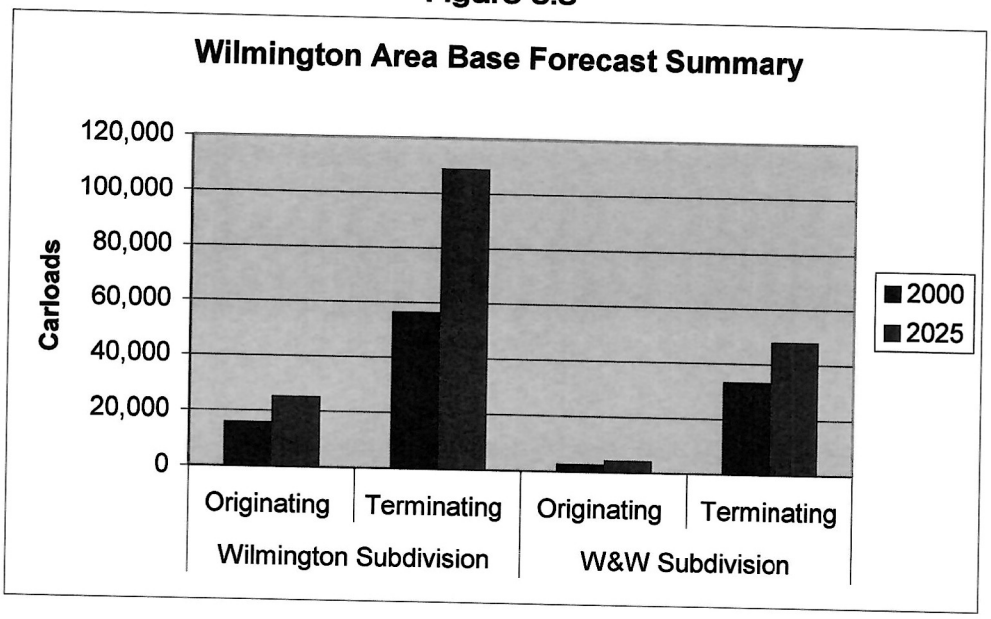


The CSXT W&W Subdivision begins at a junction at Contentnea on the CSXT "A" Line, runs south through Goldsboro and Warsaw, and then terminates at Wallace. The Clinton Spur runs west from Warsaw to Clinton to serve local industries. The W&W Subdivision carried about 6 million gross tons in 2001.

Analysis of the current traffic use was based primarily on the 1999 Waybill Sample from the Surface Transportation Board (STB). At the time the analysis was performed for this Study, the 2000 and 2001 Waybill data were not yet available. This data was made available late in the Study process, and was used only for verification of projected increases. The NCDOT Rail Division provided the STB Waybill Sample information to HDR for the Study.

Analysis and forecast of carloads is shown in Figure 5.3. As with gross tons, discussed above, the Wilmington Subdivision dominates traffic, and is expected to do so into the foreseeable future. The analysis also shows that terminating traffic is much more significant than originating movements. A review of the commodities carried on each line reveals the reasons for this.

Figure 5.3



Figures 5.4 and 5.5 show terminating and originating traffic on the Wilmington Subdivision by commodity. Coal, chemicals, and lumber and wood products dominate inbound traffic. Significant outbound traffic includes chemicals manufactured in the region. Several of the area's chemical plants both bring in materials and ship out products by rail.

Figure 5.4

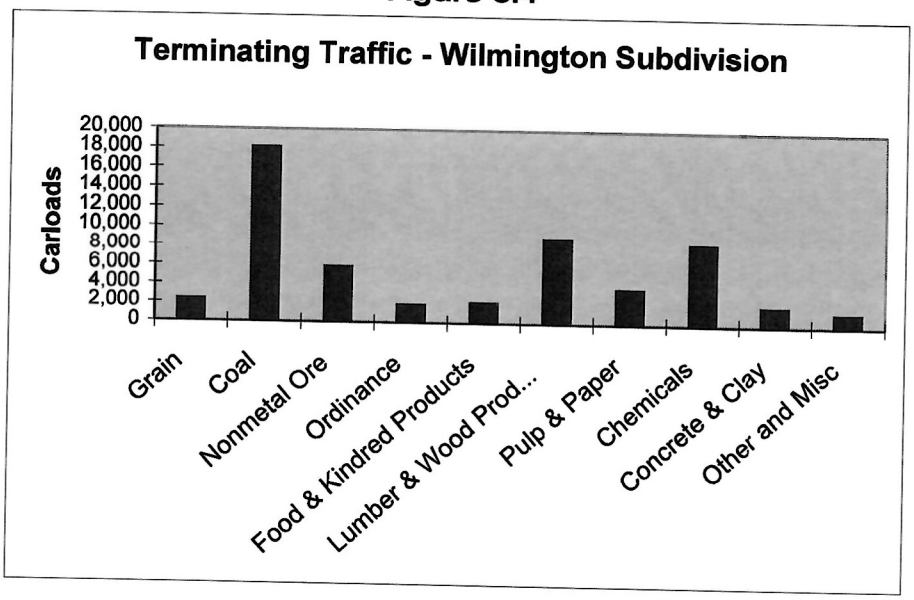
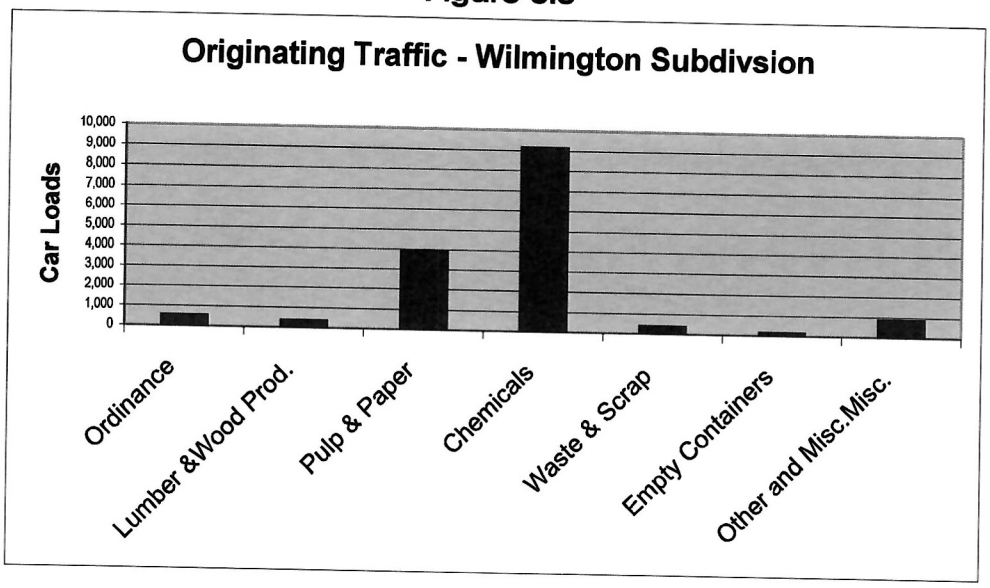


Figure 5.5



Figures 5.6 and 5.7 show terminating and originating traffic for the W&W Subdivision. Terminating traffic is dominated by grain destined for feed mills that support the area's extensive hog and poultry industry. There is little originating traffic on this line, although some lumber, other wood products, and scrap metal are shipped off the line.

Figure 5.6

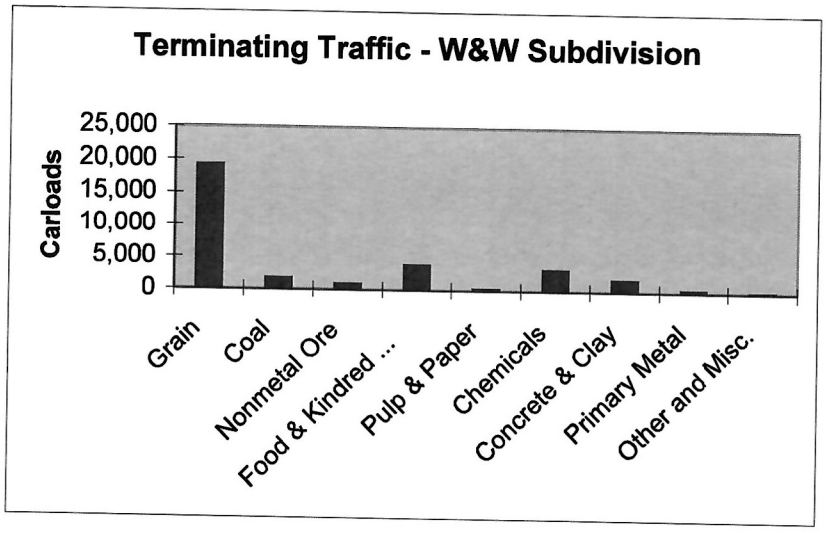
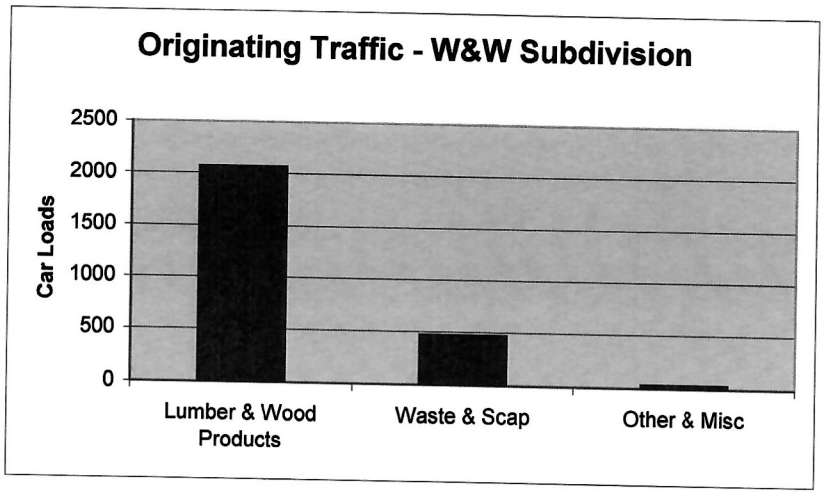


Figure 5.7



Forecasts (Without a Reopening)

Forecasts of rail traffic on the Wilmington and W&W Subdivisions of CSXT were made for the purpose of evaluating changes in traffic patterns resulting from restoration of the Wallace to Castle Hayne segment and for the purpose of determining the incremental economic benefits of reintroducing service over that line segment. Forecasts were made by commodity group, with special attention to the commodities that dominate traffic in the area. Forecasts show steady growth over the next 25 years, picking up somewhat after 2010.

Available data for making the forecasts included:

- CSXT Gross tonnage map for 2000-01 (provided by NCDOT Rail Division)
- 1999 STB National Waybill Sample (provided by NCDOT Rail Division), which includes data necessary to determine routing patterns and revenue estimates, as well as commodity data, tonnages and equipment information. That sample became the primary basis of forecasts and analysis, with other information being used for corroboration and coordination.
- 2001 rail car counts for the WTRR

Separate forecasts were made for originating and terminating traffic on the Wilmington and W&W Subdivisions. These were based either on projected growth rates for rail traffic nationally or, in the case of major commodities, on projections for those commodities based on local and regional information.

Coal: Most of the coal being shipped into the area is used by the CP&L Sutton plant north of Wilmington. Coal shipments declined through 2003 and were projected to once again reach 1999 levels in 2005. Beyond 2005 they are projected to grow at 1.5 percent per year based on increased demand for electrical power.

Lumber and Wood Products and Pulp and Paper: While these products experience significant swings in markets, rail shipments were projected at an overall long term growth rate of 2 percent per year.

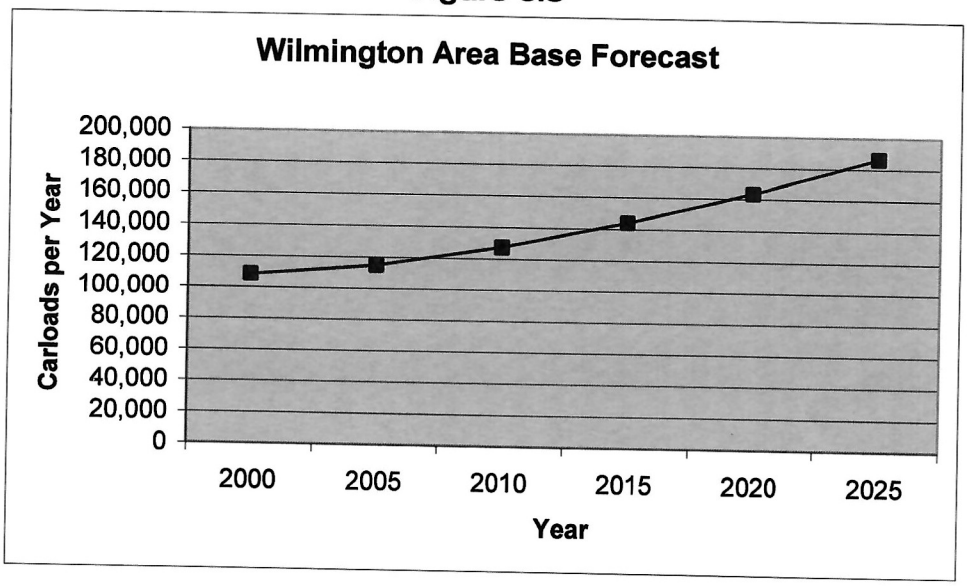
Chemicals: There was no basis to assume that transportation of chemicals would be any different from other general commodities and they were therefore projected at the same rate as all other commodities.

Grain: Most of the grain shipped to the area is used by the feed mills, supplying the hog and poultry industries near Warsaw. Currently, additional output in those industries is restricted due to a State moratorium, which prohibits industry expansion in the near future due to environmental reasons. Restrictions are projected to keep grain consumption flat through 2005. At the same time, imports of grain through the Port of Wilmington could reduce shipments from the Midwest. As a result of these two factors no growth was projected through 2010, after which grain was projected to grow at 2 percent per year.

Other commodities: All other commodities were projected at the national rate projected in the Freight-Rail Bottom Line Report that was prepared for the American Association of State Highway and Transportation Officials (AASHTO). That analysis used a base case for total shipments equivalent to 1.84 percent per year growth from 2000 to 2020.[1]

The net results of these forecasts, which represent base level of growth without reopening of the Wallace to Castle Hayne segment, are shown in Figure 5.8. These forecasts show steady growth over the next 25 years, picking up somewhat after 2010. They result in gross tonnage estimates of 31 million gross tons on the Wilmington Subdivision where traffic will nearly double. The W&W Subdivision was projected to reach 8.5 million gross tons where more modest growth was projected. Appendix I contains additional information showing how the rail forecasts were determined.

Figure 5.8



[1] Based on page 63, Table 10, average annual rate to achieve 44 percent increase in total tons shipped.

5.4 Operational Analysis

Chapter 2 contains a description of current CSXT operations on the routes being considered. It also identifies the most likely scenarios for operations after a reopening and describes resulting operational improvements. Using those scenarios as a guide, the financial analysis of the impact of the line reopening began with a review of the origins and destinations of current traffic in the Wilmington area as determined from the STB Waybill Sample. Based on these origins and destinations, an assumed routing was determined over the CSXT area network. This analysis was straightforward since there is currently only one way in and out of each point on the Wilmington Subdivision and the W&W Subdivision.

Figure 5.9
Eastern North Carolina Rail Network

The CSXT rail network is again shown in Figure 5.9. With reinstatement of the Wallace to Castle Hayne segment, each point in the area would have two possible routings in and out of the area. These alternative routings were evaluated for mileage, time and cost savings. Time and mileage savings were based on calculations from the Waybill data using standard dispatching

practices, assumed train blocking and required crew changes. Cost savings were based on the Unified Rail Costing System (URCS). Wherever time and mileage savings were identified, the alternative variable cost was calculated for the alternative routing. In most, but not all, cases where the new line provided an alternative time and mileage savings, a cost savings was achieved as well.

5.4.1 Potential Rail Service Changes with a Wallace to Castle Hayne Reopening

The reopening of the Wallace to Castle Hayne segment of the CSXT W&W Subdivision would open the Contentnea to Wilmington line as a through route. This would improve service to the Port of Wilmington and area industries for traffic moving to and from the north. The service would be based at CSXT's Rocky Mount Yard, with possibly a through train to and from Wilmington. This could potentially remove some trains from the congested Rocky Mount – Pembroke portion of the "A" Line.

Southbound cars would experience a much shorter trip, both in time and mileage. Typical general freight car shipments from Rocky Mount to Wilmington take the circuitous 257-mile routing south to Pembroke, then travel west to Hamlet, and finally head back east through Pembroke again to Wilmington. A direct 129-mile routing on the W&W Subdivision between Rocky Mount, Contentnea and Wilmington would reduce the trip length for most cars by 128 miles.

Unit coal trains follow a similar routing but generally do not travel all the way west to Hamlet. Southbound coal trains destined for Wilmington normally run west from Pembroke to a passing siding; here the locomotives run around the train from the west end to the east end. The coal trains thus reverse direction and head back east through Pembroke again to Wilmington. The direct routing on the W&W Subdivision between Rocky Mount, Contentnea and Wilmington would reduce the trip length for most coal trains by 76 miles. The improved routing would reduce a coal train's running time to Wilmington from the current +/- 12 hours to less than eight hours. This would potentially permit the coal train to run directly to the CP&L Sutton plant with the road crew, thus eliminating the use of an industrial switching crew to move the train between Davis Yard and the plant.

Additionally, if traffic volume warranted, a southbound through freight train destined for Davis Yard moving on the W&W Subdivision could set off or pick up a block of cars for the Port of Wilmington east of the Cape Fear River. Thus Port traffic would avoid Davis Yard and two movable bridges, which would reduce costs and delays. Overall, the savings in time, distance and car handlings would improve service while reducing CSXT costs due to train crew time reductions, fewer locomotive miles, car miles and gross ton-miles.

A reopened line would also provide traffic growth opportunities. CSXT currently handles millions of tons of farm products between the Midwest and the Warsaw area. The NCSPA and a consortium of hog and poultry producers recently partnered to construct a new Circ-A-Bin® system at the Port of Wilmington. This system uses conveyors to move bulk feed products from vessels at dockside at the Port to a number of on-site storage bins. This imported poultry and hog feed is then loaded from the bins into trucks and moved north to the feed mills near Warsaw. A

restored Wallace to Castle Hayne rail segment could allow the use of a unit shuttle train to haul feed products; this diversion from truck to rail would take thousands of trucks off Wilmington area streets and North Carolina highways while providing CSXT additional revenue and reducing shipper costs. (As information, the quantity of grain unloaded from each ship requires roughly 2500 trucks or 9.5 65-car trains.) Additionally, the restored route may open a new export market, whereby feed products from the Midwest could travel to the Port via the Contentnea to Wilmington route. These opportunities are discussed in detail in Section 5.5.2.

Benefits could also be realized for the relatively small volume of traffic currently moving between Hamlet and Warsaw and between Castle Hayne and Rocky Mount. The shipments save 55 and 168 miles, respectively. Again, improved service and cost savings may be able to attract additional traffic on these corridors. A restored route would provide a second rail route into Wilmington that could be used if the existing route were to be out of service due to a derailment or weather. Also, the restored route could potentially open up more "oversize" project type loads to be directed to the Port for export. The size of loads such as large electrical plant components is limited due to restrictive clearances on the two movable bridges on the only CSXT route between Davis Yard and the Port.

In summary, the improved service and lower cost of a direct route to the north would benefit existing traffic while encouraging new traffic that cannot be marketed effectively due to the current circuitous routing and attendant delays and cost. Other benefits could possibly have been identified if CSXT had been an active participant for this Study. The values listed above are conservative estimates based on reasonable judgments and publicly available costs. Additional discussion regarding the economic benefits of the reopened route is contained in subsequent sections of this Chapter.

5.4.2 Effect of Line Reopening on Rail Freight Shipments

To estimate the financial benefit produced by restoring the Contentnea to Wilmington line as a through route, traffic movements affected by the change must be identified, their new routes determined and the effects on cost and service quantified. The process begins with a set of waybills, the documents that define the origin, destination, commodity, weight and other characteristics of the shipments. Due to their confidential nature, railroads are seldom willing to provide these documents for studies, but states are able to access a statistically valid waybill sample for all rail traffic moving within or through a state. The NCDOT provided STB waybill information for shipments moving in 1999, and these form the basis of all analysis. Appendix J contains a description of the waybill sample database. Each waybill contains nearly 250 fields of data, of which the following were used in this Study:

- Origin Freight Station Accounting Code (FSAC)
- Origin Railroad
- Origin State
- Locations where the shipment was exchanged between railroads (Rule 260)
- Destination Freight Station Accounting Code
- Destination Railroad
- Destination State

- Number of Cars in Shipment
- Shipment Commodity (Standard Transportation Commodity Code or STCC)
- Lading Weight
- Rail Car Type
- Rail Car Tare Weight
- Revenue for each Railroad in the Shipment's Route
- Variable Cost for each Railroad in the Shipment's Route
- "State Through Indicator" – a flag denoting which states are traversed by the shipment

Missing from the waybill data was the station where an interstate shipment entered or left North Carolina, which is critical information for determining its route within North Carolina. By using the "State Through Indicator" to see which adjacent states were traversed, the First NC Station and/or Last NC Station were identified and appended to each waybill record. Other station information, such as county and milepost, was derived from various sources and added to the waybills.

With this data it was possible to generate a variety of shipment summaries: Volumes of Wilmington Area Traffic Originated or Terminated in each State; Volume Splits by Commodity; Traffic Originated, Terminated or Moving over Lines Impacted by the Line Restoration; and other statistics. The data also provided the foundation for the routing analysis that identified the potential financial benefits derived from the line reopening.

In order to compare the railroad's performance with and without the line restoration, two scenarios were created: ***Base Case*** reflecting current operations, and ***Alternative Case*** reflecting how the railroad would operate with the line reopened. The waybills were the same in both scenarios, but the railroad network and operations differed to reflect changes related to the restored line. An Excel-based program was written to route the traffic for each scenario, and the shipments moving over each line segment were identified. Waybills whose routes changed between the scenarios were then input to a batch version of the Unified Railroad Costing System (URCS), a program used extensively by the STB and available to interested parties for a nominal fee. The program provides estimates of the variable cost incurred by a railroad to move a railcar, using costs specific to the railroad and parameters specific to the shipment. By this means, the cost of railroad operation under each scenario can be identified, with their differences reflecting the benefits of the line restoration. URCS is described in Appendix K.

5.5 Opportunities for Potential Savings and Enhancement of Rail Operations

Improved rail operations due to the restoration of the Wallace to Castle Hayne segment would not only increase efficiency of existing operations, but also provide opportunities for expansion of rail service and enhancement of regional business opportunities. As discussed previously, these potential savings and enhancements were divided into five areas for evaluation:

1. Reduced operating costs for existing and forecasted growth of current rail service.
2. Incremental increases in existing rail traffic and forecasts.
3. New rail and Port opportunities through expanded cargo handling or expansion of new industries.

4. Location of new industries on the reopened line segment.
5. Improved access to the Military Ocean Terminal Sunny Point (MOTSU), a Department of Defense (DOD) facility operated by the US Army.

5.5.1 Reduced Operating Costs For Existing and Forecasted Traffic

Operating improvements provided by a reopening would result in cost savings for already existing and forecasted traffic. Base forecasted traffic through 2025 are independent of a reopening but represents a significant potential for operational cost savings as a result of a reopening.

In 1999, a total 44,250 loaded and empty cars are estimated to potentially have shorter trips – both in miles and time – with the Contentnea to Wilmington line opened for through service, based on 1999 waybill data. Car-miles drop by nearly 3 million and Ton-Miles decrease over 315 million. These reductions produce an average cost savings of about $185 per load, or a total of $2.6 million. Included in this figure is elimination of a crew change for Rocky Mount – Wilmington coal trains, because the shorter transit time could permit a road train to deliver to the CP&L Sutton plant without assistance from an industrial switching job from Davis Yard. Over the 20-year study period, as traffic grows, this projected savings would average $3.5 million per year. These savings represent a benefit to the railroad.

These cost savings represent opportunities to insure that current business and forecasted growth is sustained. Many of the commodities handled by the Port of Wilmington represent highly competitive niche-business that can be lost by even small increases in marginal costs to the shipper or losses in service levels such as reliability and timely movement. This is especially true for freight that requires inland rail transport or has been captured as a niche-business by offering advantageous rail-shipping to/from inland points. Current levels of rail freight along with forecasted increases in rail volumes using the circuitous Rocky Mount-Fayetteville-Pembroke-Wilmington routing are themselves potentially threatened by the higher rates and lower service levels that will continue to be experienced without a reopening. The technical and economic feasibility of providing a more efficient routing is clear. Net economic benefit (beyond covering increased operating costs and railroad benefit) is more difficult to justify or to quantify as a reopening benefit, but the Port's perennial commercial fight to retain current cargo volume levels and growth potential should be recognized as a valid increment of benefit. This benefit to current freight volumes and forecasted increases is realized from a rail reopening that would potentially both reduce rail shipping rates and increase rail service levels.

5.5.2 Incremental Changes to Existing and Forecasted Traffic

For this analysis, incremental growth is defined as that growth which would occur because improvements in rail service or reductions in rates result in increased shipments to and from existing shippers. This would occur either because of market shifts or because some shipments now using trucking would shift to rail.

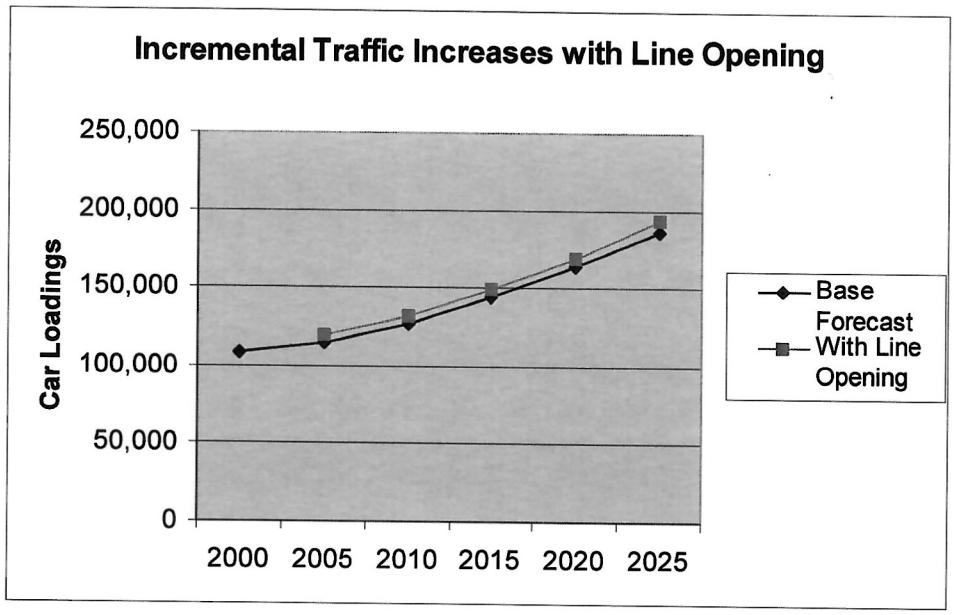
A successful reopening also has the potential for actually increasing already-projected volumes of growth. Included are commodities already handled by the Port and forecasted for continuing

growth. The reopening would influence freight that requires inland rail transport or has been captured as a niche-business by offering advantageous rail-shipping to/from inland points. The technical and economic feasibility of providing a more efficient routing is again clear. Overcoming the disadvantages of using the circuitous Rocky Mount-Fayetteville-Pembroke-Wilmington routing represents an element of additional economic benefit that would increase the forecasted volumes of these highly competitive niche-business areas by offering lower shipping rates and increased service levels.

In determining where this incremental growth might occur it was observed that some commodities are more sensitive than others to rail shipping costs and service levels. The major commodities of coal, grain and ordinance were determined not to be sensitive to these factors. Most others were assumed to achieve a 5 percent boost in rail usage from the changes in rail services.

The resulting change in forecasts for rail usage is shown in Figure 5.10. In terms of impact on the railroad, it was assumed that net revenues would be at least $185 per car, the level of savings experienced as a result of improved operations. This would amount to a boost in net rail revenues of about $460,000 in 2006 for a total of $11 million over the 20-year study period.

Figure 5.10



5.5.3 New Rail and Port Opportunities

Whereas the analysis up to now focused on changes in existing rail traffic and existing commodities, the analysis now focuses on new rail and port opportunities for attracting new commodities to the region along with new businesses or business-lines. It specifically includes the attraction of new commodities and businesses created by giving better and less expensive rail access to the greater Wilmington area from the north and northwest and newly opened access

from/to the Port of Wilmington at industrial sites north of Wallace. The ability to attract new traffic is based upon improved rail system advantages created by avoiding the circuitous Rocky Mount-Fayetteville-Pembroke-Wilmington routing. The new routing would reduce distance, running times, crew changes and provides direct Port access without using Davis Yard. Highly improved rail access to industrial sites in the greater Wilmington area and north of Wallace would also result. Industrial sites north of Wallace do not currently have a reasonable rail route to a deepwater seaport (rail access to the NCSPA Port of Morehead City is available but would require an expensive rail interchange in Goldsboro between CSXT and Norfolk Southern). A newly reopened rail segment would provide new opportunity for deep inland rail service and direct rail service to/from the Port of Wilmington to inland industrial sites.

During interviews and in review of existing Port and rail operations, a number of potential opportunities were identified. Scenarios examined included:

- Grain shuttle train from the Port to feed mills in lieu of trucking
- Increases in project cargos through the Port
- A container shuttle to Charlotte and/or Greensboro
- A Goldsboro rail-trucking intermodal center
- Increased import of grain
- Export grain and other bulk agricultural commodities
- Intermodal container service
- Manufacturing plant access to Wilmington

This list does not include potential new industry locations on the restored line segment, which will be discussed later in Section 5.4.4.

The approach taken to evaluate each scenario included:

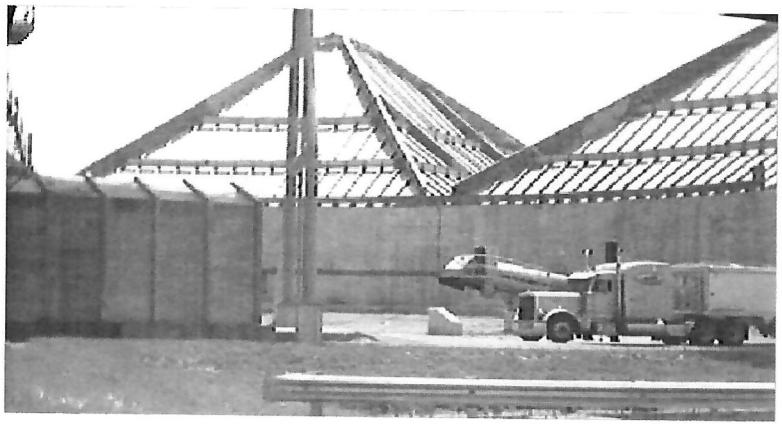
- Technical feasibility – Can the commodity be handled with reasonable adjustments to facilities and operations?
- Economic feasibility – Would the commodity earn a return to the railroad, i.e., would it cover variable costs?

Once found to be both technically and economically feasible, the additional marginal value created was assumed to be an overall benefit to the reopening project.

Grain shuttle – A recently completed grain facility at the Port of Wilmington consists of a ship-shore grain handling system and shore storage bins (Circ-A-Bins®). This joint venture of the NCSPA and a consortium of North Carolina hog and poultry producers currently is scheduled to import about 9 to 10 shiploads of hog-feed-grains by ship per year for movement by trucking to several feed-mixing sites in the vicinity of Wallace and Warsaw, both north of the severed Wallace to Castle Hayne rail segment.[2]

[2] NCSPA's financial partner for construction of the grain facility was Wilmington Bulk, LLC, a consortium of pork and poultry producers. The grain facility is operated by Carolina Bulk Transfer, an independent operating company.

Figure 5.11
Truck ready to be loaded at the Circ-A-Bin® facility at the Port of Wilmington.



The import grain project was initiated using inland trucking because rail was considered to be economically infeasible due to the circuitous rail routing available as well as the excellent Interstate 40 highway connection from Wilmington to the Wallace/Warsaw area. Essentially, no rail service was reasonably available.

This Study evaluated the ability of the Port and consortium to save significant amounts of transportation costs by switching from trucking to rail for the move north from the Port to Wallace/Warsaw. It was also noted that such reduced transportation costs might induce additional import of feed grains, thus bringing more benefits to both the consortium and the Port. The broader plan for use of the recently completed grain facility at the Port of Wilmington has been to provide less than 5 percent of total consortium needs with a potential for growing to 15 percent of needs. The other 95 percent or 85 percent would continue to be delivered exclusively by rail by CSXT from inland points.

Evaluation of the viability of a short-haul rail movement included the technical feasibility of creating adequate on-Port rail facilities and availability of rail cars for this rail routing. Adequate rail facilities on Port were found to be feasible and already included within the Port's Master Capital Development Plan of 2002. A grain loading facility in the vicinity of the Circ-A-Bins® and 4,000 feet of trackage, expandable to 6,000 feet, could accommodate 65 grain cars of storage.

Additional tracks at other locations on the Port could accommodate even longer trains. The costs of track improvements at the Port were not considered in this analysis. Use of already-available empty grain cars awaiting return to inland sites from the Wallace/Warsaw area was considered a potentially feasible means of providing adequate cars for import movements. Accordingly, this sub-scenario is considered technically feasible.

Currently, import grains brought into the Port of Wilmington destined for feed mills in the Wallace/Warsaw area are trucked from the port's Circ-A-Bins® to the feed mills, which are

approximately 50 miles north. An analysis reveals that it would be economically feasible to transport this grain in unit trains.

It takes an estimated 2,464 truckloads to transport the grain from a single ship. At a cost of $75 per trip this amounts to $184,800 per ship. Handling the same grain in 10 unit trains would cost approximately $100,000, including both line haul costs and port switching fees. Based on URCS costs this would still provide a $65 per car margin to the railroad, or $40,800 per ship, making this an attractive opportunity. As illustrated in Figure 5.12, the use of a grain unit train would result in decreased transportation costs as well as less truck traffic and wear and tear on the regional highway network.

Figure 5.12

Grain Handling Capacity by Mode (62,000-ton Grain Ship)

1 Grain Ship	=	10 Unit Trains	=	2,464 Truckloads

The grain import facility is planned for as much as 600,000 tons of grain per year, or 9 to 10 ships, allowing for 90 to 100 unit train shipments over the new line and replacing as many as 25,000 truck trips. If the grain facility reached the 600,000-ton target by 2006 this could generate an additional $408,000 per year in net revenues for the railroad.

Estimated cost savings between trucking and rail were calculated to be about $85,000 per ship using short-haul unit trains in lieu of trucks. These operating savings would have to absorb this operation's share of the increased cost of constructing a car-loader facility and rail improvements in the vicinity of the Circ-A-Bins®. Even with the cost of retrofitting the grain handling facilities at the port, this scenario meets criteria of economic feasibility. The railroad would likely welcome the opportunity to regain some of its lost business from inland rail movements and the comparative costs for rail do include appropriate commercial incentives for the railroad.

Additional marginal economic benefits would, however, depend upon Port and consortium determinations of further revenues and/or savings generated by increases in ship-delivered feed-grains vs. those delivered from inland origins. Such economic benefits are too uncertain to use specific dollar values for the benefit-cost computations of a reopening but should be recognized as at least speculative opportunities.

Figure 5.13
Nash Johnson's "Big Ed" feed mill at Magnolia is typical of those in the area.

Increases in project cargos through the Port – Highly versatile ports such as Wilmington depend upon a broad range of cargo types and typically attract mixed and niche cargoes. One common type of cargo pursued by the Port of Wilmington that is considered highly desirable and financially attractive is called "Project Cargo." Such cargo consists of large machinery, equipment, rolling stock, and often entire industrial plant components shipped as a package. These are generally one-time shipments and targets of opportunity using charter ships that make a special call at the Port just for this cargo-package.

The ability to attract the business in this highly competitive market is based not only upon pricing and handling expertise but also includes the Port's ability to provide efficient and cost effective rail service that also meets high and wide requirements of clearance on the rail route. High and wide limitations exist on the current Wilmington Subdivision segment that would be eliminated by restoration of the W&W Subdivision.

Both technical and economic feasibility are relatively clear. Although there are numerous factors other than rail capability that influence the attraction of project cargoes, the generally improved rail service into/from Wilmington and the removal of high and wide restrictions would provide the Port of Wilmington with additional tools for attracting more project cargoes than currently predicted (2001 handled 1800 tons; only modest increase forecasted for 2010). Additional marginal economic benefits would be dependent upon additional revenues generated by the Port. Such revenues are too speculative to allow their use as specific dollar values in the benefit-cost analysis, but the opportunity is there as one of several potentials that are supported by a reopening.

While this activity has potential to generate an undetermined amount of new rail traffic, no market-estimate was made as to how much more of this cargo might move through the port with the proposed improvements.

Container Rail Shuttles to Existing Inland NCSPA Facilities – Inland movement of containers to port-developed transfer sites has been a long-term competitive strategy of the NCSPA. The Port currently operates two inland sites, one in Greensboro and the other in Charlotte, for truck shuttling of containers to/from the Port of Wilmington. This allows pickup and delivery of containers at those inland sites to be more cost-effectively handled by regional trucking firms in the vicinity of those inland sites while leaving the longer-haul to those types of trucking firms. The potential for shifting the truck shuttle to a rail-shuttle was briefly looked at as part of this evaluation. The potential was eliminated as not being technically feasible but reported here to record that finding. Although short-haul rail shuttling might have proven at least marginally economically feasible, the geometry of the rail system is not a fit. Charlotte is located such that the current rail routing for CSXT is better than a reopened route to the north and northwest. Greensboro does not have direct CSXT rail service.

Goldsboro Intermodal Facility – A Goldsboro Rail-Trucking Intermodal Rail Facility was also considered. NCSPA also operates the Port of Morehead City that is located approximately 80 miles north along the Atlantic seaboard. Morehead City already is adequately rail-served from the west, north and northwest by Norfolk Southern Railway (NS) using the North Carolina Railroad (NCRR) that crosses the CSXT W&W Subdivision at Goldsboro.

Although a reopening of the CSXT routing to Wilmington does not directly benefit Morehead City, a reopening could assist in implementing a cost-saving inland truck facility scheme being investigated by NCSPA for the Port of Morehead City. A special problem has existed for the Port of Morehead City that has decreased its competitive stance with other general cargo ports along this part of the Atlantic. Rail to/from Morehead City has primarily been used for bulk-commodities and has remained competitive. However, virtually all general cargoes are moved to/from inland areas by trucking at relatively higher trucking costs reflecting a lack of paying-freight to Morehead City. Almost all trucking must "dead head" between Goldsboro and Morehead City. With the support and encouragement of economic development agencies in Goldsboro, NCSPA has been investigating the feasibility of opening an inland rail-truck intermodal facility in Goldsboro. This facility would be used as a destination/origin point for trucking to/from inland points and destination/origin point for rail to/from the Port of Morehead City. The feasibility of such a scheme will depend upon the value of retained cargoes through the Port vs. capital costs and transload of cargoes at Goldsboro between truck and rail. Financial feasibility is questionable and is key to its ultimate success.

The potential tie to the reopening question involves whether or not additional volumes of general cargoes actually handled at a Goldsboro facility would assist in justifying the capital and operating costs of the operation. That is, if a facility handled double the annual tonnage, the fixed capital recovery and operating costs would be substantially reduced per ton of cargo. As part of the reopening scheme, those additional volumes could be routed from the Port of Wilmington to the Goldsboro site. That routing would require that the site in Goldsboro had access from both CSXT and NS (technically challenging but possible at a centralized site near the rail intersection). With these connections in place, this sub-scenario is technically feasible. However, the scheme would force already well-served trucking from Wilmington onto a shuttle train and undergo a second-handling at Goldsboro. Such a shuttle and second-handling may prove to be

absorbable from Morehead City but not likely from Wilmington. On this basis, the sub-scenario is not considered to be economically feasible.

Even though this sub-scenario is not likely to be economically feasible nor does it provide enough assurance of producing additional marginal economic benefits for use in this economic analysis, it does represent one of a series of new rail options available to the NCSPA as it expands. This option for an inland intermodal site, if justified in the future, would be made possible by a reopening.

Additional Import Grains – This scenario also involves use of the recently completed grain handling and storage facility at the Port of Wilmington. Joint development of this ship loader and land storage by the Port and hog and poultry consortium included a long range objective of attracting additional import and/or export grains (plan included other bulk commodities) beyond its initial feed grain imports purpose. Additional capacity already exists within the original Circ-A-Bin® storage facility and master capital planning includes the potential for adding two more Circ-A-Bin® type storage facilities immediately south of the original. The mere availability of a modern grain-handling facility at the Port presents an attractive opportunity to add additional bulk business but in conjunction with a reopening this opportunity could grow dramatically. Importing of bulk grains for transit to inland locations is enhanced by the availability of grain-feed cars already being moved back to those locations empty. These are cars currently delivering 95 percent of the feed-grain to the Wallace-Warsaw area from the Midwest.

Technical feasibility would require that a reopening take place, a grain car loader be added to the Circ-A-Bin® complex and an adequate rail yard be developed for providing a unit-train loading and departure operation. Availability of the empty grain cars would also play a critical role. As business grows, additional grain storage and rail capacity would be required.

Essentially all of these technical feasibility elements are already included in the Port's Master Capital Development Plan. The only challenge would be in meeting substantially increased unit-train loading capacity. The initial import grain operation could be handled with the already planned rail yard that can be further expanded to handle up to 65 cars. There is not adequate space in close proximity to the Circ-A-Bin® facility to construct a "loop track" system (commonly used for high-volume, high-intensity grain operations). Although the planned rail yard would be less efficient, it would be fully adequate for early business-levels. Increasing import business would require additional car storage that could be accommodated with the new rail yard planned for the Port's new north end properties. See the discussion in the next section of this Chapter regarding rail infrastructure changes that would be required for expanded import and new export grain business at the Port As discussed previously in Chapter 2, the NCSPA contracts with the WTRR to operate on State-owned trackage that serves the Port as well as a number of local off-port industrial customers. The WTRR has expressed confidence in being able to efficiently handle import grains if track improvements were made.

Economic feasibility is principally tied to the relative value gained by the railroad in obtaining a paying-backhaul use for their grain cars. Although the costs of rail car storage and loading facilities construction at the Port would have to be absorbed, it would appear that this scheme provides the opportunities for offering attractive inland rail rates and marketing-strength for the

Port's capture of new grain business through Wilmington. Both railroad and Port operating and capital costs would be recoverable and capable of producing additional marginal economic benefit from a reopening. This sub-scenario appears to be economically feasible.

It must be noted that, as with many of the opportunities identified for the Port of Wilmington, this sub-scenario is ultimately dependent upon the successful attraction of import grain business (or other bulks) that are destined for deep inland points. Specialized grains and bulk agricultural commodities are currently being imported through East Coast ports for markets throughout the US. Examples include soy from Brazil and oats from Scandinavian Ports. Restoration of the line between the Port of Wilmington and the Warsaw-Wallace area would allow the cars currently delivering grain to the feed mills to possibly obtain backhauls of import grains.

In addition to new import grains with destinations outside of SE North Carolina, the Study also considered the possibility of new feed mills in the Wallace/Warsaw area. However, current environmental restrictions on the hog and poultry industry are expected to prevent expansion of that industry for the next ten years and thus restrict the major market for new grain facilities in this area. As a result, a major feed plant expansion in this area was not considered in this Study.

Estimates of the benefits derived from this scenario are based on a working assumption that this new business would generate one additional shipload of grain in the second year the line is reopened and grow to 5 ships over the subsequent 10 years. Assuming an estimated margin per car of $350[3], this would reach more than $1 million per year in net revenues after 10 years, or an annual average of $769,000 over the 20-year study period.

Export Grain and Bulk Agricultural Commodities - Export grains would have the advantage of utilizing the excess capacity of the current Circ-A-Bin® facility. The market for this export cargo is high but is primarily handled from the Midwest through the Great Lakes or the Gulf of Mexico ports. Except for niche grains such as soy meal, volumes are very large, demanding the availability of large silos and high capacity rail systems.

The concept of providing rail improvements for additional import grain and new export grain shipments delivered to the Port of Wilmington is a part of the NCSPA Master Capital Development Plan of 2002. The rail and grain handling facilities are included in their plan for "Contingent Cargo Growth" making expanded use of the existing Circ-a Bin® facility along with the potential for constructing up to two additional Circ-a Bin® complexes just south of the existing facility.

It was recognized during the master planning that high volume grain import and/or export operations via rail would preferably include rapid loading or unloading using a highly efficient loop track system that would accommodate unit trains of 75 cars or more. The location of the Circ-a Bins® at the center of Port operations for nearly all other commodities, as well as lack of available space, prohibits the development of a loop track system for supporting uninterrupted

[3] Calculation of revenue from grain cars currently coming from the Midwest and terminating at Warsaw shows a margin of $873 per car. However, since some of the imported grain would probably be destined for closer markets in the South and Northeast, a much lower margin was assumed.

loading or unloading of full unit trains. However, unit trains could be accommodated by using shorter tracks, which would require a heavy piecemeal switching effort with shorter cuts of cars.

A rail grain discharge facility was conceptually designed that could initially handle approximately 37 cars using a 4,000′ storage track system with the potential to be expanded with additional storage tracks of 6,000′ to 7,000′ for up to 65 cars. Blockage of other operations during arrivals ands departures of unit trains would be minimized by switching cuts of cars matching the length of each track for initial storage and later dumping cut by cut. Although this is not the favored system for high volume grain exports, it would accommodate up to 65 cars and the additional 10 cars of a 75-car unit train could be shuttled from other storage tracks in the main Port properties.

Additionally, there are two other solutions that could be used in support of the proposed track system near the Circ-a Bins®. One is the use of general rail storage on Port properties, both existing and master planned expansions, for staging of unit train segments for later switching of shorter cuts for dumping at the Circ-a-Bins®. The WTRR could efficiently accommodate unit trains in this fashion. Another solution is to stage, breakdown, and build unit trains on a large new rail facility considered as an optional development in the Master Plan on newly acquired lands north of the main port complex. These alternatives could provide the ability for the Port to handle unit trains of 75 cars or more.

Even though the Port has not been able to plan an export grain facility that would provide a typical high volume unit train rail loop system, the capability has been included to develop the means to accommodate the relatively more modest expert grain volumes envisioned in this economic feasibility analysis.

Figure 5.14
Pier side grain handling equipment at the Port of Wilmington.

The scenario is technically feasible without the through line on the W&W Subdivision. The Circ-A-Bin® used to handle import grain are designed to handle exports as well with slight

modifications. While the new line would provide a more direct route for some traffic, connections are already available over the Wilmington Subdivision. The advantage of the restored route would be in lower cost access to the Midwest and Northeast.

Potential economic feasibility depends upon establishing a market and attracting customers. Carolina Bulk Transfer, the operator of the Circ-A-Bins®, is currently working to obtain contracts for moving Midwest bulk agricultural commodities and estimates that this market could grow to more than 300,000 tons per year over the next ten years. The value of the restored line in reducing the costs of these shipments would be at least $185 per car over the existing line (the saving calculation determined earlier), and would either increase net revenues or reduce costs by this amount. The resulting benefits would exceed $580,000 per year in 10 years and would average more than $400,000 over the 20-year study period.

Intermodal Container Service – A major line of business for the Port of Wilmington is containerized cargo. This most-common system for moving goods through US ports (90 percent of all general cargoes) uses standard 20- and 40-foot shipping containers that can be carried by ship, truck and rail and transferred between any of those modes of transportation. Competition for this type of cargo, especially from the Ports of Norfolk, Charleston and Savannah, is strong and the Port constantly fights to retain its relatively small share and to attract new container business. Most containers received from overseas at these ports move inland by truck because of the proximity of regional population centers and the competitive pricing of trucks for relative short-hauls. However, recent growth at all three competing ports listed above has included an increase in the amount of containers moving more distant into the hinterlands by rail. As much as 15 percent of container cargoes from Norfolk, Charleston, and Savannah move inland by rail to more distant population centers. These so-called "intermodal" rail services, not existing today in Wilmington, have become an additional competitive factor for Wilmington to overcome. It remains a strong objective of the Port to both retain its current container business and to significantly grow that business. Overcoming the circuitous rail route from Wilmington to the north and northwest by accomplishing a reopening represents a possible basis for attracting new container business via intermodal rail.

Merely having efficient rail available for containers to be shipped is not enough to prompt intermodal container business to thrive. The inland movement of containers by rail is an integral part of a given steamship line's plan for delivering goods from origin to final destination, the sea-leg being only a part of the logistics chain. It is the steamship line (the sea-leg carrier) that arranges for most inland movements as part of a total routing decision. Their choosing of a US port is based upon that Port's multiple-capabilities to meet the line's needs for channel depths, berthing capacity, and cargo handling capability, as well as the means to efficiently move containers inland, all at the right price. Intermodal rail capability can assist in marketing new container business; but the steamship line can also decide to "add" intermodal rail services to a port-call they already make, if shipper needs require them to create such a service, and the capability for intermodal rail service becomes available at an existing port of call. A reopening of the Wallace to Castle Hayne rail segment provides the Port of Wilmington the means to potentially capture new business if intermodal rail services become a steamship line requirement.

Technical feasibility principally involves a reopening of the study-route that provides more direct access to the north-south CSXT rail corridor and its intermodal nodes in the vicinity of Rocky Mount. An intermodal rail yard with modest but adequate start up capacity is already a part of the Port's Master Capital Development Plan. This sub-scenario is therefore technically feasible if a demand for its need was established.

Economic feasibility would be a function of commercial interests of the railroad being met. A steamship line's decisions to offer an intermodal container rail service is heavily tied to gaining attractive rates and service from the railroad. Therefore, if an intermodal service is decided upon, it already means that economic feasibility has been determined, with the steamship line, railroad and port meeting financial objectives. Economic feasibility is part of the package.

The broader question of a reopening prompting significant growth in container traffic that can be tallied as a benefit is highly speculative. Completing a reopening of the Wallace to Castle Hayne rail segment would be required to meet most demands for intermodal service from Wilmington. But there are additional commercial realities that currently and in the future can over-shadow the rail connection and rail pricing issue: principally, the already "load-centering" or massing of large container operations at the competing three ports. The major container steamship lines have already chosen one or two of those three ports for large container operations (Norfolk and either Charleston or Savannah) and are far less likely to embark upon a new presence at Wilmington or to establish new intermodal connections from NC. Consequently, this sub-scenario is very speculative and fully dependent upon actually attracting new business in the face of heavy competition from other regional ports. Therefore, while the restored line would be essential for expanded service, and while it is technically feasible, expanded intermodal is economically feasible only if a container line needing intermodal service can be attracted, which is questionable in the current economy

Manufacturing plant access to Wilmington – Port strategic planning in 2002 confirmed the Port's commitment to supporting development of business of all types within North Carolina. Anecdotal accounts of industry needing efficient and proximate access to a deepwater seaport for import of raw materials and/or exporting of finished products were heard during interviews conducted for the Study. Excellent industrial sites north of Wallace and Warsaw have been functionally eliminated on several occasions as candidates for private development because of the circuitous and inefficient rail access from that area to the Port of Wilmington. A reopening would make industrial sites from Wallace to I-95 and north to Rocky Mount competitive for businesses needing rail access to the Port of Wilmington.

The sub-scenario is technically feasible and potentially economically feasible depending upon attracting appropriate industrial site development customers. As with other theoretically possible schemes for increasing general economic development, it is dependent upon actually attracting new business, a factor too speculative to allow the benefits to be used as a specific dollar value in the benefit-cost analysis of this study. HDR looked into the possibilities for better routing traffic to and from the Wilmington area by restoration of the Wallace to Castle Hayne segment. The value of the line for these purposes would be improved speed of transit and the ability to handle some high and wide loads that cannot be handled over the existing Wilmington line. In discussing these possibilities with regional and county economic development agencies and

businesses, the only specific industry identified that fell into this category was a machine manufacturer in Wilmington that occasionally needs to ship high and wide loads by rail. Even in this case the new line would not make a substantial difference to that business.

Therefore, while the reopened line would clearly benefit the Port's strategy of better links to regional manufacturing, no specific opportunities were identified and no new traffic was assumed from this specific source.

5.5.4 Location of New Industries On the Reopened Line Segment

One of the most significant potential benefits to restoration of the Wallace to Castle Hayne segment would be the ability to locate new industries requiring rail service on the restored segment. The Wallace to Castle Hayne line segment lies almost entirely within Pender County and would serve the communities of Rocky Point, St. Helena, Burgaw, Watha, and Willard. The county has a population of 44,000 and a workforce of 8,800. The county has a broad array of small manufacturing industries. Thanks in part to North Carolina's emphasis on "shovel ready" industrial sites, the county has a number of sites within close proximity of the rail line that have full utilities including natural gas. Because of an active training program through Cape Fear Community College and its close proximity to the Camp LeJeune Marine Base, the county can supply workers with a wide variety of knowledge and skills.

Through interviews with economic development officers and review of plant location information throughout North Carolina's Southeast Region, HDR attempted to identify economic development opportunities associated with rail service. Two opportunities in particular are indicative of the potential created by the presence of rail service:

a. Chemical Manufacturing

In recent years, the manufacture of industrial chemicals has expanded as an export and domestic industry. Chemical manufacturing plants often require rail service to bring in supplies and ship product. Without rail service, industrial scale manufacturing is generally not feasible. Over the past several years, economic development officers report periodic inquiries about possible plant location sites. With the addition of rail service, Pender County could have several potential sites. These plants typically employ as many as 200-300 workers and staff.

b. Metal Recycling

Metal recycling is another industry that requires rail service. A recent inquiry involved the potential location of a plant in the area that will bring in scrap metal by sea and export reprocessed product by rail. Even the ocean connection requires rail for the move from port to plant site. The new facility, to be located elsewhere in North Carolina, will employ about 65 people. Pender County could have been a contender for such an industry if it had improved rail service.

These two industries are indicative of the opportunities created by the presence of rail service. While it is not possible to be precise about what industries could be attracted to the area with improved rail service, they serve to demonstrate the potential impacts of reopening the line segment and figure heavily in the economic impact analysis. Additional grain facilities were not considered due to the current State moratorium prohibiting expansion of the hog and poultry producing industries.

For the sake of illustration of potential economic impacts this analysis assumed that the presence of the rail line would permit the location of rail dependent industry employing 50 people within 5 years of reopening, and increasing to 100, 150 and 200 employees in 10, 15 and 20 years respectively. The type of facilities discussed could easily generate 10 rail cars per year per employee and it was assumed that rail traffic to the new industrial sites would grow accordingly. This would generate an estimated $350 per car in net revenues to the railroad and could generate $700,000 per year net revenues by 2025, for an average of $263,000 per year of the 20-year study period.

5.5.5 Military Ocean Terminal Sunny Point (MOTSU)

One of the primary stakeholders in the rail service system for greater Wilmington is MOTSU. MOTSU is a key DOD seaport facility dedicated to movement of munitions and other explosive cargoes to/from overseas sites. It is the only such facility located on the Eastern seaboard of the U.S. MOTSU is a DOD facility administered by the U.S. Army and is served by the USA Railroad as described in Chapter 2. It is both isolated and dedicated to these types of cargoes because of strict explosion-safety clearances from population centers. This military port is located approximately 18 miles downstream from the Port of Wilmington on the Cape Fear River. It is a relatively heavy user of rail for movement of munitions to/from inland points using expansive rail handling facilities within the complex.

All MOTSU/DOD rail movements are via the CSXT rail system into and out of the greater Wilmington area using the identical circuitous rail routing as the Port of Wilmington for destinations north and northwest. Switching to/from the MOTSU facility is accomplished by the DOD owned and operated USA Railroad using an interchange from CSXT at Leland. Leland is accessed by CSXT trackage exiting Davis Yard, the primary staging yard west of the Cape Fear River for all Wilmington area rail destinations. The USA Railroad also provides switching from/to CSXT for three private industries (COGENTRICS, ADM and a chemical firm) located along the government-owned rail system. Current practice is to stage MOTSU and private industry cars in the CSXT Davis Yard rather than passing through-trains at Leland. This practice adds handling time to all MOTSU traffic as it does for most Wilmington area rail traffic. The inefficient rail connection at Leland hampers a direct through move from CSXT to the USA Railroad.

Private rail freight handled by the USA railroad, totaling 3,926 carloads in 2002, consists mostly of coal, cornstarch and citric acid. These commodities and carloads are included in existing and forecasted growth tallies obtained by waybill sample and therefore considered in the economic benefits analysis along with other private shipping to/from the greater Wilmington area.

Munitions and other explosive shipments to/from MOTSU vary by DOD volume-demand tied to military operations rather than commercial-factors. Rail car volumes experienced for fiscal years 2001 – 2003 is shown on the following page:

Year	Export Carloads	Import Carloads	Total Carloads
2001	569	736	1305
2002	658	699	1357
2003	1160	137*	1297*

*Imports for July, August, and September 2003 not included.

Peak numbers of total carloads by month have also been experienced including 358 in 2001, 305 in 2002 and 402 in 2003. Although the above numbers of carloads are not in themselves large enough to constitute commercially significant impacts from less efficient rail service, the freight handled is clearly a strategic national defense issue as well as virtually all carloads being hazardous and requiring some special-handling.

To relate MOTSU's needs to a possible reopening of the Wallace to Castle Hayne line segment, brief interviews were held with logistics professionals at the military facility. DOD rail operations serving private industry were easily segregated from the more critical movement of munitions and accounted for in other Study analyses concerning possible benefits. For munitions and other explosive rail freight, it was determined that the primary origin/destination sites included:

Anniston, AL
Letterkenny, PA
Blue Grass, KY
McAlester, OK
Toole, UT
Red River, TX
Hawthorne, NV
Iowa, IO
Crane, IN

With the exception of locations in Alabama and perhaps Kentucky, through-rail service for CSXT and its western connecting railroads would normally approach the greater Wilmington area from the north using the primary CSXT north-south mainlines. As such the rail operations advantages provided by a reopening i.e., shortened distance, decreased running times, decreased crew-changes and bypassing of Davis Yard could all be available to MOTSU rail traffic. Average operating savings of $206 per carload are included in the total $2.6 million annual savings for greater Wilmington area. That saving for DOD freight alone would equate to about $280,000 annually if passed through by the railroad.

Similar to commercial rail traffic, a clear basis for technical feasibility exists for MOTSU. Use of the new route through Wallace and Castle Hayne only represents increased efficiency that would be fully compatible with all operations of both CSXT and the USA Railroad systems. On the same basis the use of a reopened Wallace to Castle Hayne route by MOTSU would be economically feasible.

Additional marginal economic benefits created by MOTSU's use of a reopening are not easily quantifiable as specific dollar values for use in a cost-benefit analysis. However, MOTSU has

identified positive consequences of a reopening, many of which involve security, reliability and safety factors for their special type of freight:

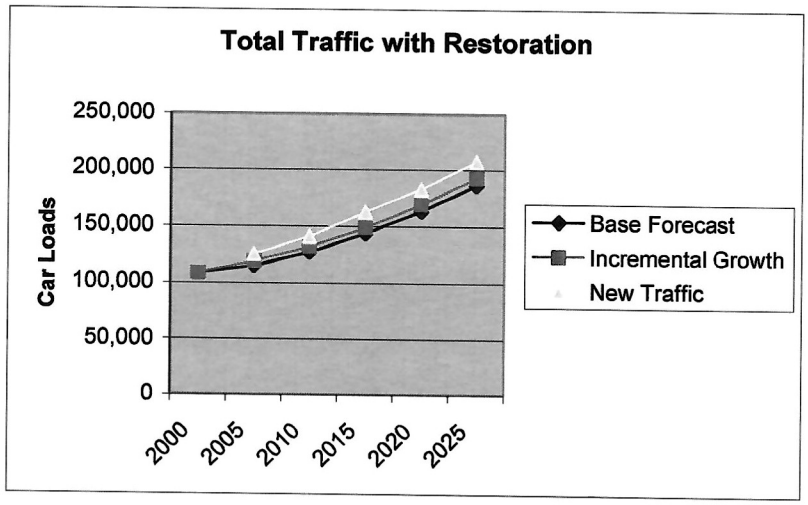
- Reduces transit time
- Reduces hazardous cargo exposure to public
- Potential to reduce the number of switches in Wilmington area
- Provides enroute rail redundancy (second route to the area)
- Provides more predictable delivery of hazardous cargo for better synchronized hand-off from CSXT with security
- Potential reduced rates for DOD private customers and DOD

Positive values of a reopening to MOTSU should be considered as strongly supporting the project even though a specific dollar value cannot be easily identified for use as a valid benefit in the analysis.

5.6 Summary of Operational Benefits

Changes in rail operations as a result of restoration of the W&W Subdivision have the potential to generate cost savings to the railroad, some of which may be passed on to shippers, and to increase rail traffic volume. Figure 5.15 shows total traffic projections with the reopening, including base traffic, incremental increases and traffic from business opportunities.

Figure 5.15



The summary of operational benefits of restoration of the W&W Subdivision is shown in Table 5.1. Cost savings and new net revenue from all scenarios average $6.3 million over the 20-year planning period. In order to compare these operational benefits to costs, which are assumed in 2005, annual benefits were discounted back to 2005. These are shown under "20-Year Present Value." They total $64.3 million.

Operational benefits do not demonstrate sufficient return in and of themselves to justify the estimated $49.3 million restoration costs and $31.6 million CSXT rehabilitation costs. However,

the potential created by restoration of a through route to the north of Wilmington and the State and regional economic benefits may provide a reason to seriously consider the project anyway. Statewide and regional economic development is discussed in the next section.

Table 5.1
Summary of Operational Benefits

	Base Year	20-Year Present Value*
Cost Savings for Base Traffic	$3.5 M	$32 M
Expanded Net Revenue from:		
Incremental Traffic Growth	$0.9 M	$11.3 M
New Shipping Opportunities		
Grain Shuttle	$0.4 M	$4.9 M
Import Grain	$0.8 M	$8.7 M
Export Bulk	$0.4 M	$4.6 M
New and Expanded Industries	$0.3 M	$2.7 M
TOTAL	**$6.3 M**	**$64.3 M**

* 2006-2025 with annual values discounted to 2005 at 5 percent per year.

5.7 State and Regional Economic Benefits

The impacts of restoration of the Wallace to Castle Hayne segment of the CSXT W&W Subdivision are not limited to operational improvements. The resulting improvements in transportation services, the increased commodity flows, business opportunities and the construction activities to restore the line will have significant economic benefits to the region and to the State. They will boost employment, income, private investment and public revenue. The restoration will also create future economic development potential. Appendix L contains additional IMPLAN information.

The economic impacts of the identified operational effects and opportunities were analyzed using the IMPLAN Input-Output model to determine effects on the region and on North Carolina. The model contains economic data relating industry inputs, outputs and investments to employment, income, earnings and other economic factors. It can be used to evaluate direct, indirect, and induced impacts of new economic activity. In this analysis direct impacts are the direct employment and personal income that result from a particular economic activity, such as railroad construction. Indirect impacts are those impacts that result from industry purchases from other businesses in carrying out the new activity. For instance, a construction company would buy equipment or supplies from a local supplier. Induced impacts are those that result from the circulation of new income from wages through the economy as households use new income to make additional purchases resulting in new rounds of economic activity. Indirect and induced impacts are often referred to as multipliers, because they multiply the impacts of initial new expenditures.

Impacts on public revenue included estimates of increased income, sales and property taxes resulting from the new activities. Income and sales tax impacts were analyzed by relating increases in personal income to expected changes in income and sales tax collections. Property tax impacts were estimated by comparing existing rates to expected new investments and to changes in railroad assessments.

The region selected for analysis included the counties of Brunswick, New Hanover, Pender, Duplin, Sampson, Wayne and Wilson, as this would be the area most directly affected by the restoration. The impact on North Carolina as a whole was also evaluated. The statewide evaluation is important for two reasons. First, the State owns the line and will likely provide at least some of the financing for restoration and has a natural interest in how restoration affects the entire State. Second, new economic activity often has impacts beyond the immediate region. For instance materials and supplies for construction may be purchased from outside the region. In addition, as incomes rise, individuals often make purchases from outside the region. The result is that the multiplied impact of new economic activities will usually be higher on a statewide than on a regional basis.

5.7.1 Employment and Income Impacts

Construction Associated with Restoration -- The impacts of the estimated $49.3 million restoration costs and $31.6 million CSXT rehabilitation costs, translated to construction costs, would have significant impacts in and of themselves. While the jobs created would be only for the duration of the project, they would be significant. An estimated 434 direct jobs would be created along with another 269 indirect and induced jobs, for a total of 703 jobs regionally. Statewide, higher direct, indirect and induced impacts would generate an estimated 957 jobs. Income generated would reach $21.7 million for the region (including direct, indirect and induced), and $31.7 million statewide.

Changes in Transportation Activities – Restoration of the Wallace to Castle Hayne segment will impact transportation industries in three ways. As shown in Table 5.2, rail employment is expected to increase for both CSXT and for the WTRR. CSXT growth is related to increases in rail traffic associated with new products being shipped through the region. Increases are net of savings that would be expected to occur because of improved operating efficiency over the new line. Increased activity of the WTRR is based on increased switching of grain traffic, including imports, exports and the grain shuttle that is expected to replace trucks in hauling from the Port to feed mills in the Warsaw/Wallace area.

The second area of change is the increase in port activity that would result from new grain shipments. This includes both port personnel and stevedore companies. New grain shipments would add an average of eight ships per year, adding up to six new jobs for loading and unloading. These impacts are estimated to be small because the most significant new business opportunities, that is, grain import and export, are highly mechanized.

Finally, trucking would experience a net reduction in jobs as a result of reductions in grain shipments by truck between the Port and the feed mills. In fact, the total loss of trucking jobs is estimated to be almost as high as the increase in rail jobs.

Table 5.2
Average Annual Impacts of Transportation Growth

Direct new employment	Employees			Income
	Direct	Indirect and Induced	Total	Direct, Indirect and Induced*
CSX Transportation	23	28	51	$2,205
Wilmington Terminal RR	15	18	33	$1,438
Port Related	6	8	14	$368
Trucking	-32	-31	-63	-$1,462
Net	12	23	35	$2,549

* 1,000s

On a statewide basis, impacts are roughly the same as for the region.

New Industry Locations – The impact of new industries on employment and income is shown in Table 5.3. As discussed under growth scenarios, the analysis considered the location of new industries as a result of line restoration. These would be industries that are dependent on rail services that are not currently available but for which the area has potential with the introduction of rail services. Key illustrations were chemical manufacturing and scrap metal processing. An assumption was made that the first plant location would likely take place within five years of line restoration and would grow to 200 employees over the following 15 years. If the industries were a mix of the typical chemical and scrap metal industries now in the area, the following economic impacts would result. An average annual total of 249 jobs would be created in the region and 262 statewide. Regional income would rise by $10.2 million per year and statewide income by $10.6 million.

Table 5.3
Average Annual Impacts of Potential New Industries

	Regional	Statewide
Employment		
Direct	75	75
Indirect and Induced	174	187
Total	**249**	**262**
Income (Direct, Indirect and Induced)	**$10,202,000**	**$10,561,000**

In addition to employment and income impacts, new industrial development will also be accompanied by increased private investment. Based on an examination of investment per new employee in recent southeast North Carolina manufacturing locations and expansions, $11 million of new investment would be expected over the 20-year period.

Other Employment and Income Impacts – Improved rail service will also result in additional incremental increases in rail traffic, as a result of expanded markets and resulting new

employment. The affect is disbursed throughout the region and, due to the difficulty of identifying specific examples, was not quantified. Nevertheless, some additional regional employment would likely result in industries where lower transportation rates or quicker delivery could result in incremental increases in markets.

In addition, several economic development officers and individuals interviewed identified isolated examples where better access to the Port of Wilmington would result in use of the Port. As with the incremental market access, these examples were too disbursed to estimate.

Total Regional Employment and Income Impacts – Summing the average annual impacts demonstrates significant economic benefit to the region. This summary is shown in Table 5.4. Over the 20-year evaluation period the project will generate annually an average of 320 jobs and $14.6 million income. The present value of this income, discounted back to construction (for comparison to costs) is estimated at $195 million. Of the total employment and income generated, that resulting from construction will be most immediate, occurring in the construction year. Other benefits will be spread over the following twenty years and increasing with time.

It must be recognized that some of the analysis is speculative in that it considers potential economic activity rather than known or pre-existing activity. In terms of the economic benefits identified here, the construction benefits are very certain based on the dollar volume of construction necessary to restore the line. Transportation benefits are somewhat less certain. The industry location benefits are the most speculative.

Table 5.4
Summary of Annual Employment and Income Impacts

	Regional		Statewide	
	Annual	**20-year Value***	**Annual**	**20-year Value***
Employment				
Construction	35		48	
Transportation	36		36	
Industry Location	249		261	
Total	**320**		**345**	
Income				
Construction	$1,828,738	$36,574,755	$2,371,767	$47,435,346
Transportation	$2,549,529	$31,772,230	$2,588,964	$32,263,670
Industry Location	$10,201,979	$127,137,065	$10,561,399	$131,616,152
Total	**$14,580,246**	**$195,484,050**	**$15,522,130**	**$211,315,168**

*20-year values for Transportation and Industry Location are shown as present value of 20-year annual impacts. Construction value is the total impact in the assumed construction year (2005).

5.7.2 Public Revenue Enhancement

One of the issues associated with public expenditures designed to increase economic growth is how much tax revenue is returned to public coffers as a result of the new activities. Based on the economic analysis presented above it was possible to review the impacts on income taxes, sales taxes and property taxes.

State Income Taxes – Personal and corporate income taxes are affected by activities that increase employment and improve productivity. In 2002 individual and corporate income taxes were approximately 3.4 percent of total personal income. Applying this factor to annual statewide economic impacts discussed previously results in an estimate of an average annual increase of $528,000 in income tax revenues to the state as a result of the project.

Sales Taxes – Sales taxes are an important source of revenue at both the local and state level. The State levies a 4 percent sales tax and local governments a 2 percent tax. An evaluation of personal income related to sales subject to the state tax reveals that the tax amounts to approximately 1.45 percent of personal income. Based on estimates of personal income impacts statewide, the project impact on sales taxes would be approximately $225,000 per year for the 20-year study period. Local sales taxes collected in the 7-county study region would be approximately $106,000 per year.

Property Taxes – Property taxes are collected at the local area to support city, county and other local government activities. Changes in property taxes that would result from reopening of the line would result from increases in values related to the railroad, to new industry investments and to new housing resulting from increased employment. Property tax rates vary by city, county and by what special taxing districts may exist in an area. For the sake of calculations, a rate of $1.07 per $100 value was used as being typical of the seven-county region.

- *Railroad property* -- Valuation of railroad property is made on a system-wide basis and allocated to taxing districts based on a state formula. The formula for distribution of value is based primarily on who operates a line rather then underlying ownership of the right-of-way. Should the State retain ownership of the Wallace to Castle Hayne segment, and if the CSXT were to begin operating it as part of its system, an allocation of value would be made to the local jurisdictions, mainly Pender County. Changes in allocation from a line reopening could add $1.4 to $1.7 million to Pender County tax rolls, resulting in an estimated $15,000 to $18,000 per year increase in tax collections within Pender County.

- *New industry investment* – Evaluation of recent industrial locations and expansions in the Southeast Region revealed an average investment per job of approximately $57,000. Based on job growth projected for new plant expansion described in Section 5.4.4, investment would total $11.4 million over the 20-year period. Recognizing that some of these investments would not take place until late in the evaluation period, the average change in property values during the 20 years would be $4.8 million, resulting in increased property tax collections of approximately $52,000 per year.

- *Housing* – New employment in the region will result in increases in the number of households and the demand for housing. Based on 2000 Census data on employees per household and average value of housing in North Carolina, the average increase in employment of 302 jobs could result in demand for another 263 housing units. The average value of a housing unit in 2000 was $108,300 for North Carolina. Even without considering inflation, this new employment would increase tax rolls by $25.3 million, resulting in increased tax collections of $270,000 per year in the seven-county region.

In summary, the impact of rail restoration on local property taxes is estimated at $339,000, including:

- Railroad property: $16,500
- New industry development: $52,000
- New housing: $270,500

Summary of Public Revenue Enhancement - Table 5.5 summarizes estimated tax impacts of restoring the Wallace to Castle Hayne segment. Total impacts would be approximately $1.2 million per year, including approximately $753,000 per year increased collections of income and sales taxes at the state level and $445,000 increase in collection of sales taxes and property taxes at the local level within the region.

Table 5.5
Summary of Tax Impacts

	State	Region	Total
Income Taxes	$528,000		$528,000
Sales Taxes	$225,000	$106,000	$331,000
Property Taxes		$339,000	$339,000
Total	$753,000	$445,000	$1,198,000

5.8 Benefit-Cost Summary

The analysis of the economic feasibility of restoring the Wallace to Castle Hayne segment of the W&W Subdivision concentrated on three primary considerations:

- Cost of the restoration project;
- Operational benefits to the railroads, port and shippers; and
- General regional and statewide economic development benefits.

These benefits are summarized in Table 5.6 (see also Figure 5.1). It is estimated that $49.3 million restoration costs and $31.6 million CSXT rehabilitation costs would be required. Benefits are compared to these costs in the Benefits column. Because benefits occur over a 20-year period, they must be discounted to present value for comparison to costs, which are assumed to occur in a single year at the beginning of the project. The present value of operational benefits, which includes efficiency savings and net new rail revenue, is estimated at $64.2 million. On an operational basis alone, project benefits do not cover costs, and if the analysis stopped here net benefits would be negative. This explains, in part, why CSXT has not seriously considered a restoration; the benefit-cost ratio from a strictly transportation perspective is about 0.8/1.

When regional economic development benefits are considered the project is more promising. These benefits include new income generated by new employment that results from construction activities associated with the project, from expanded transportation operations and from new industry development. These benefits are estimated at $195 million. When operational and economic development benefits are considered together they exceed costs by $178.8 million and

result in a benefit-cost ratio of more than 3/1. Appendix M contains a summary of economic analysis assumptions and benefits.

Table 5.6
Benefit-Cost Summary

	Restoration Cost	Benefits (Present Value)	Net Benefits	Benefit-Cost Ratio
Restoration Cost	$49.3M			
CSXT Rehabilitation Costs	$31.6M			
Benefits				
Operational Benefits		$64.2 M		
Regional Economic Impacts		$195.5 M		
Total	**$80.9M**	**$259.7 M**	**$178.8 M**	**3.2/1**

5.9 Financing Options

While this Study demonstrates the economic potential for the project, it does not address financial feasibility, which was beyond the Study's scope. It must be recognized that the operational benefits accrue to the CSXT railroad, and while the benefits are estimated to be substantial, they do not necessarily result in cash flow that can be tapped to defray project costs. This must be worked out between the State of North Carolina and CSXT.

In obtaining financing, one factor that should be considered is the potential to finance the improvements through bonding and to recover at least part of the debt service on the bonds through surcharges on cars moved over the line. If the project were financed with 20-year bonds at a 5 percent interest rate and 1 percent financing costs, annual debt service would be $6.4 million per year.

While no direct sources of potential federal funding were identified, the Railroad Rehabilitation and Improvement Financing (RRIF) Program is intended to make funding available through loans and loan guarantees for railroad capital improvements. No direct Federal funding is authorized in the current TEA-21; however, the Secretary is authorized to accept a commitment from a non-Federal source to fund the required credit risk premium. The aggregate unpaid principal amounts of obligations for direct loans and loan guarantees cannot exceed $3.5 billion at any one time, of which not less than $1 billion shall be available solely for other than Class I carriers.

Funds are used to provide direct loans and loan guarantees to—

- State and local governments
- Government sponsored authorities
- Corporations, railroads, and joint ventures that include at least one railroad

These loans are to be used to acquire, improve, develop or rehabilitate intermodal or rail equipment or facilities, including track, bridges, yards and shops.

Priority in selecting projects is to be given to those that—

- Enhance public safety and the environment,
- Promote economic development,
- Enable United States companies to be more competitive in international markets,
- Are endorsed in state and local transportation plans, or
- Preserve or enhance rail or intermodal service to small communities or rural areas

In regard to support of financing, regardless of the source, a significant portion of the funding could come from increased traffic on the restored segment. Over the 20-year study period and average of 35,000 carloads per year would use the restored segment. A structure of surcharges or revenue allocation that contributed an average of $100 per car would cover approximately one-half of the required debt service. Other sources of funding could include the railroad, Port or shippers directly benefiting from the restoration.